

Boom and Bust in the Waterberg

A history of coal mega projects



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The groundWork Report 2018

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Acronyms

AfDB	African Development Bank
AQA	Air Quality Act
BEE	Black economic empowerment
CCIA	Climate change impact assessment
Cosatu	Congress of South African Trade Unions
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECA	Export credit agencies
EIA	Environmental impact assessment
EIUG	Energy Intensive Users Group
FBC	Fluidised bed combustion
FGD	Flue gas desulphurisation
IDC	Industrial Development Corporation
IDP	Integrated Development Plan
IMF	International Monetary Fund
IPP	Independent Power Producers
IRP	Integrated Resource Plan (for electricity)
LDF	Lephalale Development Forum
MCWAP	Mokolo-Crocodile Water Augmentation Plan
MES	Minimum emission standards
mg/Nm³	Milligrams per cubic metre
Mm³/a	Million cubic metres per annum
MW	Megawatt
NUM	National Union of Mineworkers
Numsa	National Union of Metalworkers of South Africa
PIC	Public Investment Corporation
ROM	Run of mine
SIP	Strategic Infrastructure Project

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Foreword

Social justice and equity are core aspects of climate-resilient development pathways that aim to limit global warming to 1.5°C ...

(IPCC, 2018: Summary for Policymakers)

The International Panel on Climate Change (IPCC) Special Report: Global Warming of 1.5°C leaves you with faint hope even as it waters down its messages. It warns of the urgency of addressing climate change and hope lies in the message that democracy is at the core of getting us out of the dark pit of the so-called realism that avoids real action.

Social justice and equity are important in how groundWork understands environmental justice. For us, it is about solidarity and equity. I do not have much faith in politicians taking the IPCC seriously but, even if they do, the report allows them too many loop-holes. They will take them as a free pass for business as usual. So reports such as *Boom and Bust in the Waterberg* are important. There are no loopholes. It makes it clear: get out of coal, get out of fossil fuels. But more importantly, this will not happen if there is no mobilisation by society, if there is no solidarity between workers and communities, if there are no linkages between the urban and the rural, between those who have and those who do not.

In today's NGO jargon, groundWork researchers Hallows and Munnik do the first ever 'deep dive' into the political ecology of the Waterberg. This intense unpacking of the region is viewed through the framework of groundWork's 3 E's: exclusion, enclosure and externalities. That is essentially about how society picks up the cost of the elite's get-rich schemes. It is a report on the making of and state of environmental injustice in the region, and the environmental racism that is part of the process. This report presents decision



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makers with compelling evidence to rethink the Waterberg, and to rethink our addiction to fossil fuels and especially coal in South Africa. I pray they use it.

The region will perhaps be saved from the full destruction of a typical sacrifice zone, such as the Mpumalanga Highveld, because coal's heyday is over. We are at a stage in South Africa where democratic practice can shape a new future away from coal and towards energy democracy. But coal is not going to go down without a fight. So this research gives government, civil society and labour a very clear and sobering look at the past and present of coal. And it shows what the future of the region will be if it remains addicted to coal according to the designs of capital and state – of powers that are distant from the area – of essentially undemocratic decision-making.

Coal, they say, is not going to end with Medupi and Kusile. We must continue feeding these stations and mining and exporting coal for the foreseeable future. Then there is the crazy hare-brained idea of President Cyril Ramaphosa and the Chinese, to develop a new metallurgical centre grounded by a 4 600 MW coal-fired power station. We have asked for the memorandum of understanding that grounds this idea. The president has yet to respond.

Killing coal is not going to be easy, but it is doable. It is about how South Africa is going to deal with climate change, with people's health, with inequality and poverty and with unemployment. It is widely accepted that South Africa says one thing and does another on climate change and on people's rights. It speaks about the urgency of climate change, but remains addicted to fossil fuels, and coal is at the heart of this. As the now commonly quoted phrase goes: Talk left and walk right.

As we go to press, Eskom is seeking a bailout to escape the death spiral created by the decision to build Medupi and Kusile. groundWork warned Minister Pravin Gordhan of this in 2009 when, as Finance Minister, he lobbied for the infamous \$3.75 billion (now R52 billion) World Bank loan to build Medupi. This can now be seen as odious debt. The challenge we face in bailing out Eskom is that we do not know the full extent of the damage. The important question is, who is the bill for the bailout going to be sent to – the people or the corporates who lobbied for and demanded these mega projects that



were always going to be over budget, over time and riddled with corruption? They will not change the practice of dumping the community with the bill. But we cannot allow this to happen.

Mega projects have repeatedly failed society. The report picks up on the essence of how politicians and officials lie about the numbers to get these mega projects going. They over estimated the growth of energy demand to justify the decision to invest in Medupi and Kusile. The community did not ask for them, but energy poverty was used as a pretext. The reality is that the politicians, the Energy Intensive Users Group and Eskom itself pushed for it. They wanted big power stations designed to supply big industry. Now big industry does not want to acknowledge its role and responsibility in the meltdown but demands a cut price on power for industry.

The sad reality is that there was also much money to be made in just floating the idea of a mega project. The consultants, the prospective investors, the shelf companies, all are making money. The one sector that loses, whether these mega projects come to fruition or not, is the public – including government employees whose pension fund has lost R290 million on one failing coal venture. I am fearful to ask what other exposure the Public Investment Corporation (PIC), who manages the pension fund, has to coal.

We have learnt that mega projects can be defeated. The South Durban Community Environmental Alliance refused to accept the Durban dig-out port as a given. The groundWork Report 2014 focused on this. Local, national and international resistance led to the proposal being shelved till 2032. The main reason was that the lie of 'growth' could no longer be believed. Even then Minister of State Enterprises Malusi Gigaba's advisors were admitting that the politicians just wanted to hear big growth numbers.

Finally, in the early days, when we challenged the building of Medupi and Kusile, we were told that it was not strategic to build barricades against coal in both the Waterberg and the Highveld. It is clear now, with the evidence we have amassed over the years, that challenging coal on all fronts is not an option. It is a must. We do not have the luxury of time to hope that the struggle against coal and fossil fuels can wait for tomorrow. And we have



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the beginning of a 'perfect storm' of resistance to coal. In local communities, people are leading the resistance to coal without waiting for outside support. The health community now recognises that fossil fuels and coal have created a health crisis. Their response is gaining a momentum that could align well with those resisting on the ground. The pressure on fund managers to divest from coal is also gathering in intensity. And while expanding the coal economy is bankrupting society, the prices of renewable energy are dropping.

This is all hopeful, but it will not bring a Just Transition if, as society, we do not seek to define the future ourselves. We cannot leave it up to the politicians and the technocrats. Our own action is critical to secure a different future to the one they will define for us.

Bobby Peek

Director of groundWork



Introduction – coal’s last stand

The Waterberg is South Africa’s next coal frontier in the view of the industry. The coal roadmap, published in 2013,¹ issued a confident demand for expansion spurred by high prices and, they thought, limitless demand from China and India. It said 40 new mines were needed to supply four billion tonnes of coal to Eskom through to 2050, a proliferation of privatised independent power producers (IPPs) and the export market. More power stations are necessary because higher value exports are not possible unless low value coal is burnt locally. Supporting infrastructure is also required, notably massive water transfers from the Vaal, and ultimately from Lesotho, and heavy haul rail lines to get the coal to Mpumalanga and, beyond that, to the Richards Bay Coal Terminal. These plans were repeated in the first of government’s Strategic Infrastructure Projects (SIP1) intended to ‘unlock’ the mineral wealth of the Waterberg.

The roadmap has not enjoyed a good shelf life. Coal prices were crashing even as it was published. Prices recovered from late 2016 but remain extremely volatile. And the heroic projections of ever rising domestic demand for power proved illusory. Since 2010, demand has in fact dropped. Hence, Eskom’s future coal demand is open to question and the dozens of IPPs have come down to two – both of which have uncertain prospects. The water pipeline is delayed and its planned capacity is shrinking. The rail expansion is also delayed. Transnet has increased capacity, but only by a fraction of what it promised, and there seems little prospect of the assured demand needed to fund the grand plan.

Nevertheless, the Chamber of Mines recently published ‘Coal Strategy 2018’, which replays the central thrust of the roadmap. It said that “three industries ... will be adversely affected by the implementation and enforcement of strict

1 The South African Coal Roadmap available at www.fossilfuel.co.za.



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environmental laws in South Africa”: power production; Sasol’s coal-to-liquids; and iron and steel.² It suggests that, with nuclear power off the table following the ousting of President Jacob Zuma, coal-fired power must fill the gap – in our view, a gap created by the exaggerated demand projections necessary to justify coal and nuclear expansions. It laments the delays in constructing the water and rail infrastructure to the Waterberg but, even in a low growth scenario, confidently expects that it will be developed.

The Waterberg coal resource lies under the wide plain between the mountains and the Limpopo River. There is indeed a lot of coal there, but it is of poor quality and not easy to mine. Half of it is discard and most of the rest is low quality power station coal with a lot of sulphur and ash in it. The best of it is a small fraction of poor quality ‘soft’ coking coal. And it needs lots of washing to make it marketable.

As the Coal Strategy suggests, getting at it requires trashing the environment: digging out the beautiful Bushveld, a biome adapted to the arid conditions of the area; ignoring air and water pollution; pretending that climate change is small change; and maintaining ignorance of the impacts on people. Even then, it won’t make money without fat hidden subsidies. At the end, in so far as it succeeds, it will leave a mess of abandoned mines and smouldering discard dumps in a barren and toxic land. Just as it destroyed the Highveld, the coal industry now wants the ‘social license’ to destroy the Waterberg.

For us, however, coal’s next frontier looks more like coal’s last ditch. It is facing stiff resistance on a battlefield for our energy future and its own positions are crumbling. For the resistance, another energy future is necessary as a matter of survival. It demands a rapid phase out of coal and no new coal projects; a just transition to people’s power – renewable and socially owned – and a more equal society; the rehabilitation of people’s settlements; and a major effort to restore the earth – to detox poisoned lands and restore ecosystems that can absorb carbon dioxide and create resilience in the face of climate change that is already committed.

2 Chamber of Mines, Coal Strategy 2018, p.1, at www.mineralscouncil.org.za/component/.../535-coal-strategy-2018



How mega projects shaped the Waterberg

This report looks at two boom and bust cycles that have been visited on the Waterberg to create the existing coal economy and shape the local geography and at the third boom, the future boom so ardently desired by the makers of the coal roadmap. Each of the first two booms was driven by a mega project combination. The first was the original construction of the Grootegeluk mine combined with the very large Matimba power station. The second was a major expansion of Grootegeluk, to create one of the largest open cast mines in the world, and the construction of Medupi – advertised by Eskom as the ‘fourth biggest’ power station and the biggest dry cooled power station in the world. This report looks at each in turn.

The fantasy world of Mega Projects

Mega projects are huge, costing in the billions or trillions of Rand or dollars. And they are strange: they keep multiplying worldwide despite being always over budget and always delivering less than promised. Indeed, they have spawned a mega project culture which has consciously institutionalised misleading calculations of costs and benefits. Mega project analyst Bent Flyvbjerg has looked at 300 projects in 20 countries with the question “Which large projects get built?” The answer was:

... those for which proponents best succeed in designing – deliberately or not – a fantasy world of underestimated costs, overestimated revenues, overvalued local development effects, and underestimated environmental impacts [Flyvbjerg 2013: 50].

Mega projects can be so huge and run so badly over budget and time that they can pose a threat to big economies. Examples include China’s Three Gorges Dam project and Hong Kong’s new airport. The Zuma-Putin plan to build a trillion Rand fleet of nuclear power stations in South Africa would fit the bill but has, hopefully, been averted. Medupi and Kusile, the two new enormous coal-fired power stations, are each mega projects and came linked as a sort of



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super mega project. They already threaten the viability of the utility Eskom as interest on debt now exceeds profits. And if Eskom goes down, it will pull the National Treasury and the South African economy down with it.

Mega project promoters, as Flyvbjerg et al observe, "... often avoid and violate established practices of good governance, transparency and participation in political and administrative decision making, either out of ignorance or because they see such practices as counterproductive to getting projects started. Civil society does not have the same say in this arena of public life as it does in others; citizens are typically kept at a substantial distance from mega project decision making" [2003: 5].

The end result is that mega projects can "... often destabilise habitats, communities and [the] mega projects themselves..." [4]. Mega projects often come in the form of infrastructure, designed to "overcome distance and the friction of space" [5]. The results may vary but this frequently does not work. In the case of the Waterberg, the charisma of Medupi is tattered while the burden on nature and society is beyond what they can bear.

Because of their size, mega projects create boom and bust cycles in the territories onto which they descend. While they promise to bring 'development', they impose many strains on the receiving locality. They disrupt local livelihoods. They strain the local infrastructure, such as roads and water provision. They skew the availability of housing through the influx of residents who can – even if temporarily – afford to pay more for accommodation that is in short supply. Those outside the boom can no longer afford accommodation. This gives rise to real estate bubbles and ends with rows and rows of expensive but empty houses and apartments, currently evident in Lephalale as construction on Medupi winds down and the property market crashes. They bring large numbers of mostly male workers from the outside – partly because aspects of mega project construction like power stations and mines require specialist labour, and partly because construction companies – the main drivers of these booms – have their own obligations to their nomadic workers. And in the Third World, inflated job promises draw in masses of unemployed people desperately looking for work. These workers can disrupt the social fabric.



Mega projects are ‘trait making’: they are designed to change society and, as infrastructure projects, they reshape the landscape and what can be done in it. In fact, they are often ‘sold’ on the grounds that they will build or revive a local economy. But their duplicitous nature – knowingly promising more than they can deliver – means that false expectations are created, expectations that people and institutions nevertheless act on.

The first and foundational mega project was the building of Grootegeluk by Iscor (later Exxaro), of Matimba by Eskom, and the development of the wholly new white township of Onverwacht, a few kilometres from the old farmers’ town of Ellisras on the banks of the Mokolo River. This boom was driven by parastatals, in particular Iscor which needed a new source of coking coal, even one of inferior quality, as the international isolation of the apartheid regime started to bite in the 1970s. Iscor then recruited Eskom to build a power station to burn the poor quality ‘middlings’ coal to make their mine viable. But it fixed the unforgiving geography of apartheid in the area, a legacy that lasts till today. This boom was winding down in the late 1980s and ended with the completion of Matimba in 1991, just as the apartheid regime entered its last years.

There was an interval of 16 years before the second boom, induced by the construction of Medupi and the resultant expansion of Grootegeluk to provide the power station with coal. The mine expansion was completed in 2014. The much delayed Medupi mega project is now nearing completion and the construction workers are, as the managers put it, being ‘demobilised’. At peak, there were up to 24 000 workers – 18 000 on Medupi and 6 000 on Grootegeluk.³ By the end of 2018, it was planned that there would be just 6 500 construction workers left. Once completed, Medupi will employ around 500 people, while Exxaro says it employs 3 200 people.⁴

A third boom exists mostly as speculative plans, scenarios and hype. It is composed of the combination of projects meant to extract and burn the Waterberg coal beyond Grootegeluk. It is heavily contested by civil society

3 Precise numbers are impossible to obtain, indicating that nobody may know, or that there have been various inflations of the numbers.

4 <https://www.exxaro.com/operations/grootegeluk>



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organisations which resist the destruction of the Waterberg and ask why investments are being made in more coal mining and burning when climate change is upon us. This boom on paper is imagined by national government as the SIP1 development corridor that will “unlock the mineral wealth of the North” and is reflected in the Lephalale Integrated Development Plan (IDP) 2016/17, where 16 projects are shown on a map subtitled “Lephalale twice its current size in the next 5 to 6 years?” Some of the Boom 3 mega projects have already been canned, including Sasol’s Mafutha (‘fat man’) coal-to-liquids project which has left only disturbed vegetation, a deep ‘sample pit’ from which coal was taken for burn tests, and a broken road. But it still appears in the IDP. Other projects are more sounding brass than substance.

Environmental injustice

Mega projects are, by their nature, fertile breeding grounds for environmental injustice. In our analysis, environmental injustice is imposed on people through three key mechanisms:

- By polluting them, degrading their environments and coercing labour to work for less than it costs to live. This is called **externalisation** because corporations get a free ride by off-loading costs onto communities, workers, the public purse and the environment.
- By dispossessing them and by privatising common or public goods. This is called **enclosure** because it eliminates or subordinates non-capitalist systems of production, so ensuring that all escape routes are closed and people cannot survive without capitalism.
- By **excluding** them from the political and economic decisions that lead to their being polluted or dispossessed.

Enclosure, land and water grabs

Mega projects bring large sums of money into an area and are able to take over large tracts of land. In the Waterberg, the ground for this enclosure of resources was laid by earlier rounds of land and water grabs under colonial



segregation and apartheid. How land was alienated from the local population and concentrated into the hands of whites will be detailed in Chapter 1. The organisation of the land into demarcated farms capable of being sold both shaped and facilitated the current enclosure of land by the big corporations. In the post-apartheid period, minerals in the ground are notionally owned by the people, but state custodianship in fact enables their enclosure by private interests – with more or less interference by politicians. When farms are sold or used for mining, farmers may be paid out but farm workers and labour tenants and their families lose their tenuous hold on the land.

Water resources are particularly important in this arid area, and the rivers carrying water from the aptly named Waterberg were and are targets for enclosure. In the 1970s, the Mokolo was dammed to provide water to three groups of users: the irrigation farmers clustered along the lower Mokolo River; the coal mines and power stations then expected in the area; and the expected growth in the town of Ellisras (later Lephalale). As the Mokolo is proving too small to sustain the mega project ambitions on the Waterberg, engineers are planning a new river, enclosing its source in the Lesotho Highlands to bring it through the Vaal Dam and Rand Water's distribution pipes, through the municipal drains and sewers, into the foetid Hartbeespoort Dam and down the Crocodile River, from where it is to be piped to Lephalale. These plans are detailed in Box 3.

Second nature and the externalisation of pollution costs

Mega projects are large enough to change both society and the landscape. Each round of boom and bust lays down a second nature – a human-made nature, landscaped and replumbed to suit the interests of, and provide the infrastructure for, the projects. This creates perfect conditions for the imposition of pollution externalities. Externalisation is written large through Eskom's history and it has, in large measure, controlled the research on pollution. Matimba was built in the Waterberg in response to Iscor's lobbying but also because Eskom's pollution of the air of the eastern Highveld was starting to alarm health officials. Eskom then took it upon itself to decide that



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the Waterberg is under-polluted and built Matimba without sulphur dioxide (SO₂) pollution controls, as we discuss in Chapter 2. Subsequent research on SO₂ pollution either did not take place, or was not shared with the public. When Eskom decided to build Medupi twenty years later, it explicitly repeated the rationale that the Waterberg is under-polluted.

In late apartheid South Africa, the local political dynamic resulted in the black township of Marapong being placed on Eskom's land right next to Matimba. This guaranteed that the people living there would spend their lives at risk of pollution from the ongoing operations of the power station and from pollution incidents.

Exclusion from decision making

Exclusion from decision making – already harshly established in apartheid South Africa – is intensified both because the sheer size of mega projects means that the real decisions are taken at national and even international levels, and because of the more or less conscious deceptions routinely deployed by top managers and politicians. Ordinary decision making is suspended as mega project decisions are driven by what Flyvbjerg calls the 'four raptures': the technological, political, economic and aesthetic 'sublimes'.

People defending the global and local environment from externalities of pollution, and defending their communities from the destabilising impacts of mega projects, have exposed the flummery that goes with them and, on occasion, have stopped them.

The 'technological sublime' can be understood as "... the rapture engineers and technologists get from building large and innovative projects with their rich opportunities for pushing the boundaries for what technology can do, like building the tallest building, the longest bridge, the fastest aircraft, the largest wind turbine, or the first of anything" [Flyvbjerg 2014: 6]. Matimba was the first dry cooled power station of such size and Eskom repeatedly advertises Medupi as the fourth biggest power station in the world and the biggest dry cooled power station.



The technological sublime was closely linked to apartheid's political sublime. The capacity for innovative grand projects served an Afrikaner ideology of superiority based on technological prowess that would enable defiance of world condemnation and pressure against apartheid. More usually, the political sublime is understood as “the rapture politicians get from building monuments to themselves and their causes. Mega projects are manifest, garner attention, and lend an air of proactiveness to their promoters. Moreover, they are media magnets, which appeals to politicians who seem to enjoy few things better than the visibility they get from starting mega projects ... this is the type of exposure that helps get politicians re-elected. They therefore actively seek it out” [Flyvbjerg 2014: 7]. Medupi and the Boom 3 projects have been dressed up with the self-aggrandising phrases of politicians: ‘creating the first democratic city’, ‘an energy hub of Africa’ and ‘unlocking the mineral wealth of the Waterberg’.

Closely related is the third rapture, the ‘economic sublime’, “which is the delight business people and trade unions get from making lots of money and jobs off mega projects. Given the enormous budgets for mega projects there are ample funds to go around for all, including contractors, engineers, architects, consultants, construction and transportation workers, bankers, investors, landowners, lawyers and developers” [7]. Members of the local elite got rich during the Matimba boom. The retail and property markets boomed, land owners got rich, service industries sprang up and the Lowveld Bus Company was established to transport workers daily between workplace and ‘homeland’. Lowveld Buses was still around for the Medupi boom. Retail and property flourished and sand mining from the bed of the Mokolo river made at least one fortune. Lephalale mayor Jack Maeko meanwhile gained both favour and notoriety by cornering access to jobs.

Finally, the ‘aesthetic sublime’ is “... the pleasure designers ... get from building, using and looking at something very large that is also iconically beautiful...” [7]. Not everyone admires the bold concrete structures that puncture the Bushveld skyline, but the power stations certainly have presence and embody a ‘form follows function’ aesthetic. Flyvbjerg argues that “All four sublimes are important drivers of the scale and frequency of mega projects ... Taken



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together, they ensure that strong coalitions exist of stakeholders who benefit from mega projects and will therefore work for more such projects” [7]. In the Waterberg, both local and national elites benefited from the mega projects, but the coalitions were also fractious and internally competitive. These stories will be traced in the chapters to follow.



1

Creating an apartheid geography

This chapter introduces the geography and history of the Waterberg Mountains and the plains around them, to locate the battles around coal mining and burning in the area within the particular politics of place and space. It illustrates the outcome of these politics in the life of Waterberg resident Steven Tibanyane and his family, then traces them back to colonisation in the Waterberg and then sketches the situation in Lephalale and surrounding areas as the coal mega projects started.

Moving graves

In removing the seven graves of the ancestors of the families on the farms where they want to develop a new coal mine called Thabametsi, Exxaro staff were ready to do everything as required by law. They would hire an anthropologist to oversee the exhumation and re-burial by a professional undertaker: Doves. They would abide by new and stricter laws and regulations in the new South Africa that now governed this activity. Exxaro reburial policy included covering all costs associated with the exhumation and reburial of graves and the relocation of grave dressings; repair of dressings that may be damaged during relocation; supply of new grave dressings in the absence of existing dressings and the costs of ceremonial practices. They would also cover transport costs to and from meetings and the reburial ceremonies.⁵ But what they would not

5 The Exxaro approach was a great improvement on the rough treatment that the graves at Sekuruwe, 30 km north of Mokopane, received when they were removed by a contractor to the Anglo American subsidiary, Potgietersrus Platinum Ltd in 2008. The contractor used a mechanical digger, crushed some of the bones in the graves, raked others together and mixed them up, and also left some bones behind. For the full story, including the aftermath, see Saccagi, B and Esterhuysen, A. 2014. Sekuruwe Grave Relocation. South African Archaeological Bulletin 69 (200): 173–181, 2014.



Creating an apartheid geography

do is pay compensation for emotional distress for the removals of the graves. Such compensation had been paid by other developers, the consultants noted, but there was no basis in law for it.⁶

These decisions were the outcome of a series of seven meetings between next of kin, Exxaro and the consultants, Digby Wells. They give a rare insight into the grinding reality of mega projects on the ground, and the fate of community people who find themselves in the way of the mines.

A compensation debate arose when, in one of the meetings, the consultant asked the next of kin what type of compensation they would want. R500 000 was the figure mentioned. He left the room, spoke to his principals in Exxaro and then said that no more than R100 000 might be available – but this sum would be required to cover the costs of the reburials, the new gravestones and the cost of the traditional healers, which would not be paid in cash but against invoices limited to R4 500. Only after these expenses could the rest be divided amongst the families of the seven dead.

In the next meeting the consultant apologised for raising the issue, and said no, there was no such compensation. Not only would it confirm a bad precedent already set by other developers in the area, but paying compensation to next of kin would be a bad idea as next of kin who received such compensation may not be able to manage finances, the money would place them at risk within their communities and it may lead to inter-family conflict.

One of the next of kin, Mr Israel Nkoati, is recorded in the minutes as asking how the mine would be able to pay for the farms they had bought if they did not have the money to compensate people for the distress of moving their dead.

But while this compensation was out of the question, some cash was still available. The final negotiations involved the costs of the reburial ceremonies. Here there was some leeway but not too much. The families were asked to list what they needed for the ceremony but were reminded that the reburials were meant for family, not the community as a whole. No alcohol would be

⁶ Digby Wells (J. Du Piesanie), *Exxaro Thabametsi Coal Mine: Grave Relocation Project Burial Grounds and Graves Relocation Report*. Project Number: EXX0564. Prepared for: Exxaro Coal (Pty) Ltd. December 2017.



provided, with the exception of traditional beer, which would be brewed by one agreed person, with the ingredients supplied by Exxaro.

Most of the next of kin signed off on the relocations of the graves and handed in their lists. Here is the list for a family with two graves: the fee for the services of a traditional healer, 2 cows for slaughter, 2 sheep, green, baked and butter beans, 24 tins of each, chakalaka, chicken spice, chutney, coffee, cooking oil, flour, full cream long life milk, 50 kg of King Korn, powdered milk, 50 kg of mabele, 80 kg of maize meal, 20 500 g blocks of Rama, mayonnaise, Rajah spice, a box of 5 Roses tea, a box of Joko tea, 2 boxes of rooibos tea, 10 kg of white sugar, 25 kg of brown sugar, tomato sauce, vinegar and yeast, beetroot, butternut, carrots, cucumbers, green, red and yellow peppers, 3 bags each of lettuce, onion, potatoes, sweet potatoes and tomatoes, 3 cases of Coke, Fanta, Sprite, juice, Sparletta cream soda and Lemon Twist, 5 cases of water, take away plates, 10 dozen eggs, 200 plastic glasses, firewood and 3 packs of Southern Spice. It is not clear from the documentation whether this list was fully accepted, but the exhumations and reburials took place in November 2017.

Among the group, Steven Tibanyane steadfastly refused to sign. He was unhappy that only grave relocations were discussed and not land claims. At the meeting, he said he would refuse the relocation of his family's graves as this would undermine his outstanding land claim. And he would not allow the Thabametsi project to be developed. In explanation, he related his history: He had lived on the farm Vaalpensloop since 1985; the previous land owner, Louis Rossel, evicted him in 1995; he had since lived in Marapong but periodically checked on his 'property'⁷ and graves; Louis Rossel demolished his 'property' in 2012; he moved to Vaalpensloop in 2013 to ensure the safety of his graves; he received a letter from Exxaro in 2013 stating that he is not allowed to live on the farm and the sheriff removed all his possessions. In response, an official from the Department of Rural Development and Land Reform told the meeting that, to lodge a land claim: the claimants must have been forcibly removed;

7 The scare quotes around 'property' appear in the minutes recorded by the consultants. It seems that they decided that Tibanyane's moved household goods could not be called his property without reserving some legal distance.



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claimants must have been land owners or labour tenants; and, if the claimants have moved by themselves, they will not be eligible.

Tibanyane's grandfather originally came from Botswana, married a local girl and settled on the farm Slangfontein. His grandfather and father lived on land owned by the Smith family. They had their own herd of around 36 cattle, including oxen for ploughing, and were paid by the Smiths to plough. They also had access to dryland cropping fields where they planted *mabele* [sorghum]. The Smiths owned seven farms, most of them adjacent to each other and close to the farm Grootegeluk on which the Iscor mine was built. According to Tibanyane, the farmer Thinus Smith stopped ploughing in 1973 and started farming game. This apparently coincided with reduced rainfall as the local climate shifted to a dryer phase. Smith then paid the Tibanyane family a cash sum to compensate them for the lost income from ploughing, for reducing their cattle holdings and losing their right to plant on the farm.⁸

The arrival of coal mining intensified the Tibanyanes' problems. Iscor bought farms in the area, and prospect drilling started. Tibanyane's uncle got a job as a security guard at an underground coal mine⁹ but was burnt to death when a gas bottle exploded. That mine did not get any further, says Tibanyane, due to the presence of groundwater as well as "big snakes moving with whirlwinds" – a creature of local myth.¹⁰

Altogether, the Tibanyanes lived on the farm for 52 years. In 2014 they were pushed off the farm, after it was bought by local transport mogul, Louis Rossel. Their furniture was moved into storage and is still there. They also opened a land claim, together with the Maluleke and Ngobeni families.¹¹ Tibanyane also opened a case with the Commission for Promotion and Protection of the Rights of Cultural, Religious and Linguistic Communities. In fact, Mr Tibanyane, who says, "I have wrestled with this issue for a long time," has sought help from a large number of organisations and institutions, so far with little success.

8 Steven Tibanyane interviewed 11 April 2018

9 Presumably on the only underground coal mine in the area, at Hoornbosch.

10 Ballim 2017, as well as Kandorozu in our interview with him, discuss beliefs among locals that "angry spirits" interfered with early stages of coal prospecting and mining.

11 SAHRA.org records a land reform case/ESTA complaint LP/1415/0142/TK., dated 2012/8/27



They include the SA Human Rights Commission, the Public Protector, the Land Claims Commission, the land rights NGO Nkuzi, a lawyer in Pretoria, the Heritage Council, the High Court, and more.

The Tibanyanes are only one of many families – no-one knows how many – who had increasingly tenuous rights to live and make a living on white farms, but were displaced as Exxaro, Eskom, Sasol and other coal companies moved into the area. Steven Tibanyane represents just one of many families who feel aggrieved, as the development of the coalfield in the Waterberg added one more layer of injury to the decades of colonial and apartheid discrimination. We have listened to similar histories in Marapong, in Leseding near Steenbokpan and in Ga-Seleka.

The graves of ancestors represent much more in black culture than they do in white culture. The spirits of the dead remain tied to the place where they are buried. They provide access to the ancestors when their descendants want to connect to them for advice, for solace, for placating them when things go wrong. These bones are also an unmistakable claim to previous and long standing occupation: to the right to be on the land and to live from it. That these bones are denied their full reality – ignored, mixed up and moved around by mining corporations – is no accident. When they are moved, a host of claims that may impede mining are destroyed.

Today, Tibanyane is a staunch opponent of coal mining in the area. He has joined forces with people from Lephalale, Steenbokpan, Marapong, Seleka and Shongwane to resist coal mining in the area. To understand how this history of multiple and layered dispossession and resistance developed, and how it was deepened by the arrival of coal mining, we need to go back in history.

An ancient history

Two worlds meet in the Waterberg Bushveld. One world is that of outsiders – explorers, white farmers and businesspeople, and later of absentee game farm owners and parastatal employees – coming into the Waterberg. The other world is that of the ancient landscape of the Limpopo Valley. This world has



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long been in existence, following the Limpopo River not as a border but as a highway that led from the ancient tin mines of Rooiberg near Thabazimbi, to Mapungubwe, first city in South Africa, and beyond that to the Mozambican coast, through which the Limpopo civilisation connected to Arabia, China and other world centres of trade [Bergh 1999; Ekblom et al. 2011].

People have lived in and travelled through the Waterberg area for a very long time. The remains of pre-human hominids, *Australopithecus Africanus*, dating from 2.8 million years ago, were found on the western side of the Waterberg in the Cave of Hearths in Makapan Valley [Walker and Bothma 2005]. The remains of Stone Age people from about a million years ago have also been found in the Waterberg. Waterberg conservationist Clive Walker argues that the local rocks – conglomerates and river pebbles – were useful for making stone tools. The Waterberg Mountains formed natural shelters and are rich in rock art by San and later Iron Age farmers.

At Olieboomspoort, near Lephallale, early Stone Age occupation dates from around 400 000 years ago. Then, between 200 000 to 150 000 years ago, there is evidence of middle Stone Age occupation near Lephallale, Thabazimbi and Mokopane which may have lasted till 30 000 years ago. Later Stone Age occupation – by hunter gatherers – in the Waterberg dates from the late 11th and early 12th century.

The record shows continued early Iron Age occupation between 800 AD and 1700 AD along the Lephallala River valley and, from 900 AD, evidence of a trade route linking to Mapungubwe and Sofala on the Mozambique coast. The Khoekhoe people have been present intermittently for at least the last 1 500 years and Nguni speaking people from around 1660 AD. Rock engravings at Nelsonskop, now part of Marapong, date from this period.

Iron deposits worked by Sotho-Tswana people in the Waterberg Mountains have been dated to the 1840s. Alongside this evidence of extensive human settlement and movement through the Waterberg and the plains around it, there is also evidence of changes in climate, including a period of higher rainfall in the Limpopo Valley at the start of the 19th century [Ekblom et al



2011]. This changeability may have meant that there were dry periods when there were few people in the area.

The first white people arrived in this area only in 1818 and, by 1850, they had started farming in the area, relying on the knowledge and resources of the people they found there [Walker and Bothma 2005; Zulu 2015]. But the Waterberg was not settled by whites in large numbers. Settlers who came with the Great Trek preferred the Rustenburg-Thabazimbi area to the west of the Waterberg and the Potgietersrus-Soutpansberg area to the east [Bergh 1999].

It is from this perspective, as people from the outside, that the Waterberg was seen as an area of vast potential, ‘a world behind a mountain’, where there is game to be admired and hunted, some agricultural potential that could serve as a support for white occupation, irrigation potential along the rivers, and a coal field to be exploited. It was a landscape to be incorporated into the mining-driven economy of South Africa, to be created by pushing out from the heartlands of gold, coal and steel in and around Gauteng, already created by colonialism, segregation and apartheid.

Water from the Waterberg

For the visitor travelling north from the inland metropolises of Johannesburg and Pretoria, the Waterberg Mountains rise from the Springbok Flats as a series of ramparts known as “the seven sisters” [Walker and Bothma 2005]. They are an ancient geological formation – 1 200 to 1 800 million years old – composed mostly of hardened sandstone which was not eroded away like the plains surrounding it. The mountain range rises to a high point of 2 085 metres (m) above sea level and is dissected by internal valleys varying from 1 200 to 1 600 m above sea level. These valleys feed four Waterberg rivers, which flow north to the Limpopo. The Waterberg Mountains have a higher rainfall – up to 700 mm per year – than these arid plains to the north – around 400 mm – and the rivers bring life-giving waters to the plains before flowing into the Limpopo and then east to the Indian ocean [Walker and Bothma; 2005 DEA 2010].



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The biggest water yield from the Waterberg Mountains flows down Mokolo River, into the Mokolo Dam and on past the town of Lephhalale. It drains an area of 8 450 square kilometres (km²) with a mean annual run-off¹² of 272 million cubic metres (m³), of which 98 million m³ can be used economically, according to the DEA [2010]. After the river leaves the mountains just south of Lephhalale, it is lined by irrigation farms on both banks, each with a narrow frontage to give them access to river water.

This lower stretch of the Mokolo is a sand river. For the most part, the water flows under the surface and within a deep bed of sand. The sand bed was created over millions of years from the sandstone mountains, and forms an aquifer that stores as much water as Mokolo Dam does.

The Mogalakwena River drains the eastern side of the mountain range, towards the town of Mokopane in the local municipality of Mogalakwena, from a catchment area of 19 327 km² which produces a run-off of 140 million m³ a year. This river is twice dammed, at Glen Alpine and Doringdraai.

The next biggest river is the Lephhalala, with a catchment of 4 866 km² and an annual run-off of about 135 million m³, which runs through the eastern side of the Lephhalale Local Municipality. It is associated with Stone and Iron Age settlements [Bergh 1998]. The lower reaches are now densely settled, with a series of villages stretching along 60 km of the eastern bank and housing a majority of the population of the municipality. These settlements were formerly part of the Lebowa bantustan. Most of the area falls under the traditional authority of the Seleka chieftaincy, currently embroiled in a succession dispute, while a smaller area in the south, Shongwane, falls under Chief Shongwane. The villages vote in a majority of councillors in the local municipality and the current mayor, Jack Maeko, hails from there.

The much smaller Matlabas River, to the west of the Mokolo, forms the boundary between the Lephhalale and Thabazimbi local municipalities. Its annual run-off is only 38 million m³, of which an estimated 9 million m³ is available for use.

12 The mean annual run-off (MAR) is the part of the rainfall (precipitation) that makes its way to the river system in a year, averaged over several years.



Further west is the Crocodile River, which flows north from the continental divide,¹³ from Johannesburg and Pretoria into the Limpopo.

Because of the difficulties of travelling through the mountains, there were historically four main ways to enter the plains beyond the Waterberg: from the Thabazimbi area to the south-west; from the west along the upper Limpopo valley, crossing the Crocodile and Matlabas Rivers; from the east, crossing the Mogalakwena River from the Mokopane area; or from the North, across the Limpopo River from Botswana.

Thabazimbi means mountain of iron.¹⁴ The mining town was established by Iscor in the 1930s and was connected to the railway line from Rustenburg to supply iron ore to the Iscor steel factory in Pretoria West. It is from this base, skirting around the Waterberg from the south-west, that mining expansion reached into the Bushveld when, in the 1980s, Iscor built a railway line to carry blend coke from the Grootegeluk mine to its Pretoria steel works. The capacity of the coal line has been expanded recently, but more ambitious plans – to carry Waterberg coal to Eskom’s Highveld power stations as well as to Richards Bay for export – are stalling. This is also the route for a planned pipeline – Phase 2 of the Mokolo Crocodile Water Augmentation Project (MCWAP) – intended to bring more water to Lephalale’s power stations and mines.¹⁵

The eastern part of the municipality includes the more densely populated area of the former Lebowa homeland, to which people were removed from the ‘white’ area around the village then known as Ellisras – now part of Lephalale town. This was another route into the area. Many current residents trace their origins to areas and tribal structures in Botswana, across the Limpopo River to the north, in particular the Bakgatla. Following the Batswana-Boer War of 1852-53, the Limpopo was established as the boundary between Botswana and the Zuid Afrikaansche Republiek (ZAR).

13 The continental divide separates the run-off that flows north and east to end up the Indian Ocean via the Limpopo, from the run-off that flows south and west down Vaal and Orange Rivers to the Atlantic Ocean.

14 A made-up name combining Tswana and Fanagalo or Zulu.

15 The economic feasibility, as well as the social and environmental impacts of these schemes, are under serious questions. See chapter 4 for full discussion.



A remote area

White settlers first traversed the Waterberg in 1818. The first of them were part of a military expedition from the Cape Colony who passed through the west side of the Waterberg. As far as we know, all died after reaching the Limpopo River. The trader David Hume passed through the mountains in 1825 and Wahlberg, a Swedish naturalist and hunter, followed in 1844. In 1890, the traveller and entomologist W. L. Distant described the Waterberg as vast and untouched.

For some, the remoteness of the area was an attraction. “The Waterberg was also a refuge for remittance men, draft dodgers, gun runners, traders and the makers of strong drink,” according to Walker and Bothma [2005: 49]. It was also attractive “because of its rumoured rich mineral deposits, ivory and vast herds of wildlife” [48]. In 1836, a Boer commando was aware of tales of gold, presumably referring to Mapungubwe further east along the Limpopo River, where gold and trade objects were later found. In 1839 tin and silver deposits were (re) discovered at Rooiberg, on the Western (Thabazimbi) side – they were previously part of the Stone Age Mapungubwe trade route. During the latter half of the 19th century, there were a number of violent conflicts in the area, including between Chief Mokopane and the Boers in 1854, between the Pedi leaders Sekhukhuni and Mampuru in the 1870s, and in 1900-1902, when the Anglo-Boer war touched the area.

White farms, black labour

The period between the 1850s and Anglo Boer war of 1899-1902 saw a growing encroachment of white farmers onto what had been black land in the territory claimed by the ZAR – the old Transvaal. This appropriation of land was supported by a generous system of white entitlement. Thus, white farmers were entitled to two farms each which they could claim with support of a ‘veldkornet’, a local official who was part of the ZAR system that combined military and civilian authority. These farms could be claimed by white settlers – and land speculators – regardless of black ownership, occupancy and use, and regardless too of whether they could actually take possession of the land.



Where the new owners did take possession, African communities were coerced into labour tenancy, rent tenancy and share cropping as they lost their land. Africans could be forced into service on farms through taxation, as punishment for infringements such as settling too close to a white town, or for pass offences – travelling without ZAR documents – as well as through the practice of indentured labour [Bergh 2010]. Under this pressure, land ownership and resources for farming shifted from black to white.

People contested the loss of their land and the coercive labour conditions. They also fled from the farms to nearby communities that retained their autonomy. Whole communities moved to escape the increasingly harsh domination imposed in the central districts of the ZAR which were more densely settled by whites. Some escaped to the remote Waterberg, including the Bakgatla ba Moseitlha led by Makapane, who left the Apies River near Pretoria in 1872 because of a land dispute [Bergh 2010].

Other people moved in for different reasons. The Moloantoas crossed the Limpopo from present day Botswana around 1890 and were the first people to settle along the Lephhalala River, according to James Moloantoa.¹⁶ Later, the Seleka people arrived from Botswana and the Moloantoas gave them land to settle. Since there had been conflict between Seleka and Moloantoa in Botswana, a minority of the Moloantoas did not accept this decision and moved upriver to join the Shongwane people.

A group of Herero families arrived from Namibia around 1918, escaping the genocide of their people by German colonial forces. Their descendants are still involved in negotiations with the German and Namibian governments about these events.¹⁷ After 1954, more people came into the Lephhalala area from the mainly Pedi area to the east, which became the Lebowa bantustan in 1972.

The long process of land passing from black to white hands continued well into the twentieth century, and was described by Sam Sekati:

16 James Mahlomola Moloantoa, interviewed 13 September 2018.

17 Hosea Kamatuu Kandorozu, interviewed 16 April 2018.



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Yes, you must remember the government was for the whites. So they came here, they're staying with you, you borrow [lend] them your cows to plough a portion and later on one morning when you wake up they will call all of them and tell them no, as from today I'm the owner of the farm... it's up to you to stay with me or go and look for another place ...

And then he will buy your cattle for far less, he will keep on reducing your cattle until you are left with nothing... until they kicked you out. But they don't just kick you out – they make sure the conditions are so difficult for you to live there then at the end you say no I better go and not live here with all these conditions. And then you will go to another place. You have 100, 200 cattle and then you are left with only four or five. And their tactic was that if you refuse to [sell] your cattle and then you decide to move to another place, another farm, the farmers will communicate. They will say, if a black person is coming to your farm, don't allow him to bring so many cattle. So that was the strategy; that there is nowhere to run [quoted in Ballim 2017: 71].

After the Anglo-Boer War, a 'unified South Africa' was constructed. It was in this period that the whole Waterberg was finally divided into farms. In order to 'build the new nation', the government undertook various irrigation schemes and drilled boreholes to support white agriculture [Tempelhoff 2018]. It was during such a drilling campaign, in the 1920s, that coal was discovered [see Chapter 2].

After 1948, when the National Party with its declared apartheid policies came to power, the balance of power on the farms shifted decisively in favour of white farmers. However, black residents managed to keep a foothold in the then Ellisras and on surrounding farms. Ballim quotes an inspector from the Group Areas Board who visited the area in 1966 and "found to his dismay that African families were spread all over the general district of the town. Many of the 'squatters' occupied farmlands with the consent of the owners in tenancy arrangements" [2017: 84].



By the 1960s and 1970s, forced removals intensified. Ellisras farmer and businessman Willie Loots remembers:

When I was a little boy [about 50 years ago], outside to the north of the town, there was a location ... where there were black people living all the way down the road towards the Tafelkop mountain. That is why that whole area ... is under land claims today. People who lived next to this road were moved to Shongwane, not because of mining and the power station – they had to be removed because they were ‘a danger to white people’.

Loots and his family were themselves removed from the farm Witfontein, “where the Witpoort Hospital now is, at the top end of Seleka. We were forced to move in the middle 1970s as part of homeland consolidation.”¹⁸

The settlement of Pahama, about two kilometres north of Ellisras, was destroyed in the late 1970s. Gerry Maré, then of the Institute of Race Relations, recorded that “very little research has been done on the extent of urban relocation, in the sense of moving Africans from ‘white’ towns to nearby ‘homeland’ areas” [1980: 26]. Nevertheless, the Sunday Express reported in 1979 that approximately 20 000 Africans had been moved from the towns of Nylstroom (now Modimolle), Naboomspruit, Ellisras, Vaalwater and Louis Trichardt to Steilloop in the Lebowa homeland, approximately 100 km from Ellisras (now Lephalale). In addition:

At Ellisras the township, 2 km outside the town, has been flattened – because it had been an ‘illegal squatter camp’... [also] Men who work in Ellisras have been moved to a compound 20 km from the town [Maré 1980: 27].

Victor Munnik, who grew up in the area, remembers this as the Pahama location. One day there was a church surrounded by people living in brick houses, and the next day the people had been removed and the houses

18 Willie Loots interview, 12 September 2018.



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flattened. 'Pahama' means to make one's own home, for example when getting married and moving away from one's parents.

Creating a white town

Ellisras was declared a township in 1960. It served the surrounding farming community and was on the road to the Stockpoort border post, crossing into Botswana. There were very few amenities at the time: a bus stop, a hotel, a bottle store, a shop and two churches. In 1965, Ellisras District Development Association was established and placed under the authority of the Peri-Urban Areas Board in Pretoria. The first and only permanent official at Ellisras was appointed in 1966, in the position of 'health official' [Ballim 2017: 77, 83].

There were a number of efforts to develop the town by local business people, but these fell short due to the absence of a reliable water supply. Ellisras townspeople all relied on pumping their own water direct from the Mokolo sand river bed. To ensure that everyone had access, these properties all had narrow strips of river frontage – which would later turn out to be a planning nightmare for Iscor as it tried to establish a town. The bulk water supply was established after the completion of the Mokolo Dam in 1981 and the town itself only became a municipality in 1986, after the entry of Iscor and Eskom into the area and the construction of the township of Onverwacht. This is pursued as part of the next chapter.

Farming and hunting

The growth of the town was constrained by the local economic conditions. The Bushveld plain behind the Waterberg had never made for easy farming. First, it suffered from a lack of water which was only alleviated by settling close to rivers and by several campaigns of state sponsored drilling of boreholes for white farmers. Secondly, some of the grazing contained plants like the *gifblaar*, or 'poison leaf', and *tonnabossie* which, especially in the 1950s, infested several farms and poisoned cattle.¹⁹ There were also frequent droughts, the result of

¹⁹ Susan and Piet Goosen, interviewed 13 April 2018.



the climate fluctuations in the area that go back beyond the Iron Age. These conditions came to a head in the 1960s:

During the 1960s the growing unfeasibility of cattle farming compounded the dire economic state of agriculture in Ellisras. An inspector who visited the district in 1965 encountered a district that was far from prosperous. A four-year drought from 1961 to 1964 had decimated cattle holdings, leaving farmers heavily indebted. The virulent spread of foot and mouth disease among cattle followed hot on the heels of the drought. Due to efforts to restrict the spread of the disease, presumably quarantine measures, farmers were unable to sell any cattle to repay their loans. The inspector discovered that the overgrazing of farmlands had encouraged soil erosion to levels that made recovery unlikely [Ballim 2017: 70].

Hunting in the Waterberg had been an attraction for both early adventurers and farmers from the Thabazimbi and Soutpansberg districts since the 19th century, when large numbers of wildlife were decimated for sport hunting, skins, meat and ivory. The issue was already politicised, with the Volksraad debating measures against black people hunting – described as ‘poaching’. But the modern game economy only took off as a result of drought in the 1960s and, by the 1970s, many farmers had introduced game onto their farms.

Fencing a farm allows the farmer to claim ownership of the game animals on the farm. Piet Goosen, a medical doctor and farmer, and his wife Susan arrived in the area in 1976. There were hardly any game fences then, although prominent farmer Johan Pistorius dates the first game fence in the area to 1974. Goosen argues:

Hunting is a better business than farming. The hunters are accompanied by their family and friends ... It was a whole new economy and it worked – there are so many lodges and lodges are big businesses. [Game gets hunted] but everything does not go back to America. The meat is divided among the local people ... As a result, in the later 1970s local farms were sold for good money into the game farming industry.



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According to Pistorius, game farmers in the Waterberg went on an advertising campaign to attract overseas visitors in the 1980s [quoted in Ballim 2017: 74]. This was also the period in which the South African Department of Agriculture decided to support game farming, throwing its weight behind farmers who had already taken it up. The number of large mammals in South Africa increased dramatically, from 340 000 in 1966 to 1.7 million in 2004. Ellisras was recognised early on as a leading game farming area. Research from 2007 indicated that recreational hunting, at a value of R3.1 billion, far outweighed income from meat production, at R42 million a year [Carruthers 2008]. The trade in wildlife also increased from 1965 when the first game auction was held near Tshipise. Today, Hardus Steenekamp farms exotic game breeds like black springbok and golden wildebeest on two farms near the Grootegeluk mine.

Lephalale residents witnessed a boom in hunting. On the Goosens' account:

Now there are professional hunters registered with the DEA. If you are a hunting outfitter, you pay an annual fee to be allowed to bring in hunting tourists. So there are more jobs in hunting: trackers, guides, professional hunters, butchers, taxidermists, exporters; and on the hospitality side, cleaners, cooks, hospitality staff, laundries – five star services. There are Arab princes who have land here. They fly in with helicopters, with their own doctors etc ... Tokyo Sexwale has big land here. They come with visitors from all over. Of course, there are also more ordinary hunters, ordinary people who shoot for biltong...²⁰

For farm workers, this transition to game farming could be sudden and came with serious consequences. For many farm dwellers – especially in the mountains of the Waterberg which is now largely covered by the Waterberg biosphere and which contains nature reserves and hunting farms – it meant a loss of employment and homes.²¹ Large parts of the Waterberg were re-

20 Susan and Piet Goosen, interviewed 13 April 2018. 'Outfitter' is the industry term for a business that organises hunting tours and operates camps and lodges.

21 Marc Wegeriff, telephone interview, June 2018.



created to provide a bush and hunting experience in an Africa largely devoid of people. This is a return of the colonial imagination [Zulu 2015].

Other farm workers were started off on careers as hunting guides. Hosea Magoai was born on a farm in Steenbokpan in 1948 and is the patriarch of a farm worker family. He recalls that one day, without any warning, the farmer brought in a truck full of game. They fenced the farm and Magoai and his son Steven became trackers and guides. On Steven's account:²²

I was 12 years old when the antelopes arrived. There had been kudu and rooibok (impala) on the farm, but their numbers increased after fencing. The numbers of cattle were reduced to make space for them. People came to the farm to hunt. We would know where the game is and where they come to drink water. When the farm is fenced, it is easy.

He went to the hunting school in Ellisras, where he learnt to butcher game animals and skin them for trophies.

From 1998 I worked as a hunter's guide for both Oom Gert Steenkamp and then for his son Danie. I lived with Danie from 2002 to 2007. In September 2007, I left because I needed to earn more money for my wife and children. Being a hunting guide gave me too little money. There are only four hunting months in the year. That is not a long time and the money is not good, except for the tip from overseas visitors. They can give you a tip that is 50 Euro. But [otherwise] it is little money... and in 2010 I started working at Babcock.

When the Babcock construction job – erecting power lines for Medupi – was finished, he went back to being a hunting guide but on short term informal contracts. Says Steven:

There are three farmers who phone me. The pay differs from one occasion to another, R150 or R200 per day. It could be a Thursday, Friday, Saturday, Sunday. Four days, or seven days, or 10 days at a time,

22 Steven and Hosea Magoai, interviewed 12 September 2018.



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depending on the hunters' plans. These are scarce skills, there is only one other hunter like me here.

Zulu (2015) argues that the development of game farming in SA has perpetuated “the segregation of the black population from wildlife utilisation” [2015: 59] and created a separate and still very colonial space to consume, used mostly by white males. It is not only an economy, but also a construction of space.

Fear of terrorists in a border area

Conservation and game farming are enterprises that involve a military style control over territory and the exclusion of unauthorised people. The semi-military occupation of land was part of the earlier history of the 19th century, characterised by commando raids, offensive and defensive actions, and local wars. The ZAR Volksraad relied heavily on the local commandos and commandants. In 1899, a Waterberg Commando was formed for the Anglo Boer War and, in one form or another, commandos were organised in the Waterberg up to 2005 when the commando system was demobilised by Thabo Mbeki's administration. To this day, however, who enters and stays on both game and other farms, is tightly controlled.

The Waterberg is a border area, with Botswana on the other side of the Limpopo River. Early support to white farmers – both under the ZAR and the Union of South Africa – aimed to encourage the establishment and maintenance of a white population in such border regions. The military also had a presence. Hidden in the Tafelkop Mountain, a secret radar station kept a constant look-out for air attacks on the apartheid republic as part of a radar network started in the 1950s. In the 1970s and 1980s, as South Africa's neighbours threw off the colonial yoke, there was a growing awareness of the risk of ‘terrorists’ crossing into South Africa as armed insurgents. A land mine explosion in 1980 confirmed these fears. Farm workers were coached on how to respond to such insurgents. Former farm workers recall, “We were told about terrorists who would come into the area ... When they came, we went to our bosses and



warned them ... Then the police would come and get them.”²³ The apartheid state was also prepared for conventional warfare and launched a full military invasion of southern Angola.

An apartheid geography

When the first boom took place in and around Ellisras – with the creation of the Grootegeluk coal mine, the Matimba power station, the new white township of Onverwacht and, later, the black township of Marapong – it was on the basis of an apartheid geography that has developed since the late nineteenth century, and has remained largely intact to this day [Hermanus et al 2010].

The foundation of the apartheid geography was the division of the area into a grid of white commercial farms. The majority were cattle farms but there were also more than 200 irrigation farms along the Mokolo River, producing for markets in the interior of the country. From the 1960s, a hunting and tourism economy began to emerge. On the farms were farm dwellers who had lost their status as tenant labourers with some independent means, as tractors and other mechanised implements replaced them. The developing municipality was in the hands of a small group of local businessmen and notables, determined to keep it white and make it whiter. ‘Black spots’ were cleared and, by design, there was no black township.

Some people were moved to Steilloop, 100 km from Ellisras, and others to “Mokerong 1”, the area alongside the Lephhalala River, which provided homes for an increasing number of black South Africans from a number of ethnic groups. For administrative convenience, this area was incorporated into the ethnic Pedi homeland Lebowa.

23 Group interview, Leseding, 12 September 2018.



2

Boom One

The development of the Waterberg coalfield was set off in the early 1970s when it seemed increasingly likely that the rest of the world would impose sanctions on apartheid South Africa. Parastatal steel producer Iscor feared that, without imports, it would run short of coking coal for steel making. Steel was vital not only to the economy but also to the fast developing South African arms industry.²⁴

This situation set off a chain of developments which utterly transformed the area through two cycles of boom and bust driven by mega projects, with a third in prospect. It led to the establishment of South Africa's largest open pit coal mine, Grootegeluk, developed by Iscor and now owned by Exxaro; two huge Eskom power stations with a combined capacity of 8 800 MW – Matimba, completed in 1991, and Medupi, still under construction; the virtually new and much larger town of Lephalale, including the new white residential area Onverwacht and the black township of Marapong; the removal of black residents to Mokerong 1, an outlier of the Lebowa 'homeland' along the Lephalala River, and to Steilloop more than 100 km away; a dam on the area's biggest river, the Mokolo, and a series of pipelines to augment water supply to this arid area. Much of this was implicit in Iscor's original planning [see Buermann 1982] and was also shaped by Eskom's ambitious plans to expand the national power supply following the completion of a national electricity grid in 1973.²⁵

24 Armscor was established in 1968 to procure and manufacture arms for an increasingly isolated white Republic. See https://web.archive.org/web/20061119200216/http://www.idrc.ca/fr/ev-68067-201-1-DO_TOPIC.html.

25 See <http://www.eskom.co.za/sites/heritage/Pages/1960.aspx>



This chapter focuses on the first boom and shows how the apartheid geography of the area was largely preserved, separating black and white, workers and managers, and disadvantaging the former, as the cycle of boom and bust created winners and losers. One of the losers was the integrity of the environment as processes of degradation of water, soil and air were set into motion.

Iscor fears shortage of coking coal

South Africa has large coal deposits but is not well endowed with coking coal, a specific high quality coal that is used both for heat in the steel making process and to incorporate carbon into the steel. In the second decade of apartheid rule, Iscor felt insecure and wanted to develop and control its own source of coke for two reasons. The first was that calls for international sanctions against South Africa had intensified in the 1960s and, by the early 1970s, Iscor feared that coking coal imports might soon be cut off. The second reason had to do with the politics of who owned the northern Natal coalfields where Iscor got good quality 'hard' coking coal for use in the blast furnaces in Pretoria, Vanderbijlpark and Newcastle. At the time, Anglo American was buying up collieries on the Natal coalfields and, as historian Faeza Ballim argues, Iscor's top managers were active in the Broederbond and saw Anglo as a threat to the Afrikaner nationalist agenda [2017: 42]. Either way, Iscor felt insecure and wanted to develop and control its own source of coke.

According to Claris Dreyer, formerly the chief geologist at Iscor and Exxaro:

With coking coal running short, Iscor was looking to augment Natal or imported coke with 'blend' coke. The quality of the Waterberg coking coal was not great. It was blending – or soft – coking coal, which could be used together with straight or hard coking coal, requiring the art of selecting the blending coking coal with exactly the right characteristics. This was done through intensive research by Iscor scientists.²⁶

²⁶ Claris Dreyer, interview 9th April 2018. Dreyer doubts whether this research capacity – crucial to developing the Waterberg coalfield – still exists in either ArcelorMittal, which has taken over Iscor's steel making business, or in Exxaro, which inherited the coal mines.



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Iscor's board took an 'in principle' decision to develop the Grootegeluk mine in the early 1970s. That decision was informed by decades of learning about the Waterberg coalfield. Coal was first discovered in 1920 and, by 1941, Iscor knew that the Waterberg coal had a metallurgical fraction.²⁷ However, Iscor managers had to draw up a feasibility report for the Iscor board, specifying the 'proven reserves' of the Waterberg coalfield. In doing so, they had to move from knowing that there was coal under the ground – that is, a resource – to developing economically feasible plans to extract that coal – that is, to show 'proven reserves'.

The Waterberg coalfield

Unlike in Mpumalanga, where coal was exposed by river action in places such as Steenkoolspruit, the Waterberg coal seams do not outcrop on the surface. In the Waterberg, the coal was only discovered during government subsidised drilling of boreholes for water, in March 1920, on the farm Grootegeluk 25 km west of the small village of Ellisras. In the next 50 years a few hundred boreholes were sunk in several campaigns and, by extrapolating from the borehole cores, as well as analysis of bulk samples in box cuts or shafts, geologists could construct a picture of the coalfield. However, only when actually mining can anybody be sure of exactly how the rock formations are arranged.

The Ellisras basin, as geologists call it, is an outlier of the major Karoo group which covers more than half of the country and includes the Mpumalanga coalfields. The Waterberg coal was laid down in the Ecca Group, the coal bearing rocks of the Karoo group, between 260 and 190 million years ago, as a result of swampy conditions which led to exuberant plant growth. This plant matter became peat in the absence of oxygen,²⁸ and was then compressed and heated as later layers of earth were deposited on top of it, and so turned into coal. The Ellisras basin, then a shallow sea, was filled not only with the coal-bearing Ecca layer, but also other layers above and below the coal. The coal is

27 Dreyer, interview 11th September 2018.

28 Under conditions where so much organic matter is produced, large amounts don't go through the normal decomposition process but instead are buried out of reach of oxygen..



Box 1: Resources and reserves

The difference between resources and reserves was crucial in discussions in the 1970s about how much coal the Waterberg coalfield holds, as well as current debates about future exploitation of the coalfield. In simple terms, a resource is what is in the ground, a reserve is what can be mined.

The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the SAMREC code),²⁹ defines a ‘Mineral Resource’ as: “a concentration or occurrence of solid material of economic interest in or on the Earth’s crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling” [2016:18].

There are three ways to describe resources, depending on the confidence with which the estimate is made. An **inferred resource** means that the size, grade and mineral composition of a resource can be estimated with low confidence from existing information garnered from boreholes, outcrops, pits and workings. **Indicated resources** refer to resources whose characteristics have been sampled to arrive at a reasonable level of confidence for estimates of metal content, grade, tonnage, shape, densities etc. **Measured resources** are resources that have been estimated by qualified geologists with a high level of confidence, usually in terms of a mining code.³⁰

A reserve is mineable. According to SAMREC, “A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors” [2016: 25]. Reserves can be either ‘**probable**’ (lower level of confidence) or ‘**proved**’ (high confidence).

29 Available at <https://www.samcode.co.za/>.

30 From Wikipedia, https://en.wikipedia.org/wiki/mineral_resource_classification



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To move from resources to reserves, competent persons need to develop increasing certainty about the quantity and quality of the coal, as well as market, regulatory and other conditions that would affect bringing the coal to market. These ‘modifying factors’ include mining and processing technologies and their costs, marketing, legal, environmental, infrastructure, social and governmental factors.

In other words, the economic, regulatory and, to some extent, social aspects must be taken into account. Given this calculus, it is understandable that estimates of coal resources and reserves change over time, as more knowledge is gathered and as more coal is mined. Reserve calculations would also change as regulatory environments and markets change. In practice, these calculations form the basis for business plans that invite or persuade investors to put money into coal mining.

preserved in a sequence of 11 seams. The full sequence is, on average, 115 m thick and it lies beneath another 20 m of ‘overburden’ at Grootegeeluk and the rest of the shallow area, while in the deep coal area the overburden reaches 400 m.

The bottom four seams are equivalent to the Vryheid formation in the Mpumalanga coalfields. Hence, they have a similar structure to the Mpumalanga coal, with sandstone layers in between each seam. The top seven are equivalent to the Volksrust formation and “the coal is less well defined”, according to Dreyer [2012:32]. These seams have been nicknamed a “barcode” sequence, as the layers of coal and mudstone are intimately mixed, resembling a barcode in a shop.

At least 50% of the mine output goes to discard dumps. Because these discards are nevertheless rich in carbonaceous (coal-like) materials, and have a coarse form which allows oxygen to flow through, they are prone to spontaneous combustion within three weeks of being dumped [Vermeulen et al, 2014]. The other 50% contains: 10% ‘blend’ coke – a soft coke that must be blended with hard coke before it can be used in steel making processes; 30 to 40% thermal



coal – low quality ‘middlings’ for use in power stations; and 10% ash.³¹ The sulphur content of the coal is regarded as medium at 1.15 – 1.49% sulphur, but much higher than the washed export grade bituminous coal from the Witbank Coalfield at an average of 0.62% or the Ermelo Coalfield at 1.00% [Makgato and Chirwa, 2017].

The coalfield is divided by geological faults into a shallow coal section to the west, and a deeper section to the eastern side which was downfaulted (downthrown) by about 300 m, and then covered by other, non-coal-bearing formations of the Karoo supergroup. This deep coal is not accessible by underground mining as there are no rock formations dividing the top seven seams that could provide a roof for the mine – as the sandstone in Mpumalanga does. It is effectively unmineable. Underground gasification and other unconventional methods may be possible but seem unlikely to all but a few enthusiasts.

By all accounts, Grootegeluk took the sweet spot for coal mining and other hopefuls on the coalfield will likely find that the coal is more difficult to mine and of lower quality. In his overview of the Waterberg coalfield, Dreyer warns, “The Grootegeluk area is the only part of the Waterberg coalfield where both the Upper and Middle Ecca coal zones³² can be extracted through opencast mining,” and adds that “over a large area in the coalfield, the full succession (zones 11 – 5 of the bright coal) is not present anymore due to weathering of the upper part of the bright coal zones”, and in other areas the coal is weathered away in parts [2012: 90].

Because of the low quality of the coal, Grootegeluk has had to build the biggest washing plant in the world. Other miners will be challenged to repeat this. Moreover, extensions to the Grootegeluk mine – to supply 14.6 million tonnes to Medupi on top of the 14.5 Mt per year for Matimba as well as a doubling of soft coke product to 3 Mt a year – could be made relatively easily, since the basic infrastructure is in place, inherited from the parastatal Iscor.

31 Claris Dreyer interview, 9 April 2018

32 That is, both the Volksrust and Vryheid formations.



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The Waterberg coalfield stretches about 90 km east-west and 40 km north-south, covering approximately 360 000 hectares. It is one of 19 coalfields in South Africa, seven of which are clustered in the Mpumalanga central coal basin, while the others are scattered around the north-eastern part of the country. It has been promoted as the last coal frontier in South Africa, with an almost inexhaustible resource.

How much of South Africa's coal resources and reserves are contained in the Waterberg coalfield? According to Dreyer, it "... has vast *in situ* resources of coal equivalent to more than the Witbank and Highveld coalfields combined" [2012 :33]. According to Hancox & Goetz, the Waterberg coalfield contains "between 40 and 50% of SA's remaining coal resources" (2014: 228).

In 2012, Dreyer put the coalfield's resource in the shallow area accessible to opencast mining at 35 770.57 Mt, with potential 'run of mine' reserves of 3 307.8 Mt. What that means is that only about 10% of the resource may actually be mineable while only half of that 'run of mine' (ROM) material can be turned into marketable product – if a market can be found. Nevertheless, at current exploitation rates the Waterberg coal could last 80 years, far beyond what a credible climate change response requires.

Iscor secures the coal

Ben Alberts, who was in charge of the development of Grootegeluk, gave a detailed account of it to the Southern African Institute of Mining and Metallurgy (SAIMM) shortly after completion in 1982. He reported that: "In March 1920 the intersection of thick coal seams was reported from a water-boring operation on the farm Grootegeluk ... 25 km west of the present village of Ellisras in the Transvaal." From 1941 to 1952, the Geological Survey of the Department of Mines drilled 143 boreholes and sank two prospecting shafts. The results indicated "vast reserves of metallurgical and non-metallurgical coal", according to Alberts [1982: 344]. In 1965, Sasol was also prospecting in the area and drilled an additional 120 boreholes. Iscor undertook coking tests on several bulk samples from a prospecting shaft on the farm Grootegeluk, as well as from a line connecting this shaft to another on the farm Hieromtrent.



On this basis, Iscor moved to secure the mineral rights to the coal. “In 1955, coal on 29 farms was reserved by the Minister of Mines for Iscor and Sasol, two more farms were added in 1961, five in 1964, and a further 89 in 1965. As a result of this reservation, Iscor and Sasol are the only two parties qualifying to apply for prospecting or mining leases in respect of coal over a total of 125 farms in the Waterberg coalfield” [344].

Iscor also started buying the farms themselves. In 1957, it bought six farms located on what it knew to be the best spot on the coalfield: Leeuwdrift, Grootegeluk, Hieromtrent, Daarby, Enkelbult and Turfvlakte. In May 1973, Iscor started an intensive drilling programme on these farms as part of a thorough investigation into geological reserves and coal qualities as well as the appropriate mining methods and beneficiation processes. It also looked at the availability of infrastructure, capital costs and working costs.

The resulting feasibility report led to the Iscor Board approving development of the mine in 1975. The report contained Iscor’s future plans in a nutshell. First, says Alberts, the exploration programme showed the reserves to consist of some 500 Mt of metallurgical coal and 1 700 Mt of power-station coal on the six ‘Iscore farms’. Initial tests had shown that “the [metallurgical] coal was suitable for use in the present Iscor blend. Bulk tests still had to be performed to confirm the laboratory test work” [1982: 346].

Second, it identified the key infrastructure issues. The immediate requirements were that: water should be made available from a dam to be built on the Mokolo River, about which the Department of Water Affairs had published a White Paper in 1970; and electrical and rail connections would be possible from the Thabazimbi area where Iscor’s iron ore mines were already established. Later, Iscor would have to establish, from scratch, a range of other infrastructure including two townships – one black and one white – roads and water works.

This ambition might have qualified the Grootegeluk mine as a mega project in its own right, but it was the third element of Iscor’s plan that really makes the mega project with the reach to dramatically transform this part of the Bushveld. Due to the quality of the coal, “a middlings fraction consisting of steam coal would arise from the envisaged beneficiation process and would



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have to be marketed or otherwise disposed of” [1982: 346]. Joe Meyer, who was present from the start of the Grootegeluk project and later became the mine manager, comments that Iscor had to “persuade Eskom to build a power station here” to burn this low quality coal.³³ But this was not just a matter between Iscor and Eskom. Dreyer puts it bluntly: “government forced Eskom”. Otherwise the thermal coal would have to be added to the discard and that would amount to 80% of production. Without Eskom, the mine could not be viable.

This principle of burning the bad coal for electricity is hardwired into the South African coal mining business model – a coal mine is only feasible if its bad coal is burnt in a power station while its better coal is exported or otherwise sold at a premium. Iscor’s feasibility report finally concluded: “Estimates of capital and working costs prepared in the standard Iscor format indicated that the planned mine could provide the necessary coking coal at a production cost comparable with what was being paid to some of the existing suppliers.”

Because of the poor quality of the coal, Iscor needed to construct “the world’s largest coal beneficiation complex where 7 600 tons per hour of ROM coal is [today, in 2015] upgraded in six different plants” [Deysel 2015: 34]. These six plants were built between 1980 to 2015, and formed a large part of the mine construction work.

Grootegeluk delayed

The plan was to have the mine up and running on the 1st of July 1978, “as predetermined by Iscor’s Raw Materials Provision Plan” [1982: 348]. In 1975, Iscor prepared contracts and terms for infrastructure, housing and the provision of water, electricity and sewerage in the new white township, black construction camps, workshops and mine offices. Much work went into preparing the design and tenders for the beneficiation plant, which included a crushing and screening plant and storage silos, a heavy-medium drum plant, primary and secondary heavy-medium cyclone plants, froth-flotation plant, stacking and reclaiming plant, load-out station and waste-handling system.

33 Joe Meyer, interview 13th September 2018.



Two aspects of this coal washing plant contribute to the mega project status of the Grootegeluk-Matimba construction: it was to be the biggest in the world; and it used novel engineering to overcome constraints imposed by 'nature', in this case by the quality of the coal.

However, by the mid 1970s South Africa's economy was under increasing pressure both economically and politically. Capital was scarce and the Iscor Board decided to stop the Grootegeluk contracts – with the exception of those already signed – in order to complete a set of major and expensive projects it was already committed to: a new steelworks at Newcastle, major expansions at Vanderbijlpark steel factory, construction of the Sishen-Saldanha iron ore export infrastructure, and expansions at the Durban Navigation Collieries and the Glen Douglas Dolomite Mine. At the same time, the demand for steel was on a downward trend.

The deadline for commissioning was moved to July 1980. For the next two years, wrote Alberts, the project fought to survive. Key personnel were already in their positions. They continued with the design of the massive coal beneficiation plant, as well as pre-stripping of vegetation and digging out the overburden to the point where they could begin extraction of coal.

Because Iscor could not find overseas funding, it negotiated a long term 'lease agreement' with Standard Bank to enable it to complete the project. The agreement brought in around R110 million, and "made financial history in South Africa" as one of the biggest plant-leasing contracts ever written in the country. Even in world terms the deal was a large one. The agreement included a preference factor for local content.

Iscor exercised tight control over the project to build the Grootegeluk mine and associated infrastructure. For example, construction of the beneficiation plant was not a turnkey or outsourced project. Iscor remained in control of the key functions including "complete plant design, ... acquisition of all process equipment, ... control of erection contractors to achieve set technical standards and design parameters, ... control of the work in progress, ... detailed financial control, ... complete hot commissioning of the plant ... [and] acquisition of



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individual guarantees from all the suppliers and erectors with regard to their responsibilities” [Gilliland 1982: 358].

In the end, Iscor managers proudly reported that the first metallurgical coal was despatched to the Vanderbijlpark Iscor Works on the 23rd of July 1980, seven days earlier than planned. Alberts also reported capital savings on the beneficiation plant and confidence that it would reach its design parameters with working costs in line with the prediction of the initial feasibility study [1982: 351].

The external infrastructure of the mine

Iscor’s plan was not only to construct a coal mine with a massive beneficiation plant, but to transform the whole area. The ‘internal infrastructure’ of the mine and beneficiation plant was only part of the challenge. As Buermann put it [1982: 355] “the requirements for the infrastructure for a mine in underdeveloped territory are considerable”, especially because “... as far as the mining project was concerned, infrastructure had to be established as if no other existed” [353]. It included taking responsibility for “roads and an airfield, townships including all services, a major water-supply scheme, a railway line from Thabazimbi and marshalling yards at Grootegeeluk, and an extensive housing and accommodation scheme” [353].

Onverwacht would be the new white township, named after the farm just beyond the southern boundary of the coalfield, on which Iscor would provide “some 2 100 domestic sites and all appurtenant facilities such as school and business sites”, starting with “some 350 houses, single quarters, an apprentice training centre, and full recreational facilities (e. g. club, golf course, etc.)” [Buermann 1982: 354]. There would also be a separate township for married black employees, with single quarters for 1 200 workers and full supporting facilities including a canteen, shop, post office, and medical and sports facilities. Some 20 km of tarred provincial road and some 40 km of secondary gravel roads would be provided to enable mining operations. Iscor built a 1 200 metre-long tarred airfield. The South African Railways constructed a



113 km extension to the national rail network while Iscor built 26 km of rail marshalling and loading yards.

While the Department of Water Affairs built the Mokolo Dam, Iscor took charge of the management of water for the area. To transport water from the Mokolo Dam, it constructed some 47 km of steel pipeline, 700/800 mm in diameter and capable of delivering 1 000 litres a second (l/s), along with a pumping station, storage reservoir and distribution pipelines.

Iscore also built a water-purification plant delivering 40 l/s, with a possible extension to 200 l/s, supplying a 6 000 m³ reservoir which in turn supplies township feeder mains some 33 km long. And it provided a water-borne sewage system for the townships and the mine. As was typical in apartheid South Africa, even people's shit got treated differently. The white township was served by an effluent-purification works while the black township was served by an oxidation pond.

Mokolo River and dam

Water forms a crucial constraint on development of the Waterberg coalfield. A 1970 report from the Department of Water Affairs records the planning for a dam on the Mokolo River to stabilise irrigation along the river, to supply water for coal and iron ore mining, and to prepare for township development and the possible development of industries.³⁴ Initially, the department investigated the water potential of the Mokolo because downstream farmers were complaining that over-abstraction upstream left them without water.³⁵ In 1970, around 2 480 hectares were under irrigation in the area downstream from the proposed dam. Assuming that 70% of this was actually irrigated in any given year, it was estimated that annual abstraction was around 15.6 million m³ (Mm³) from the river and the sand aquifer. The report noted that development of the coalfield was still only 'tentative', but estimated a water demand for it of 6.6 Mm³ per year by 1976 and between 13.3 Mm³ and 40.8 Mm³ per year by

34 Report on the proposed Mogol River Construction Works, Report to the Minister of Water Affairs, 1970/71. Mogol was the Afrikaans name for Mokolo.

35 This water demand subsequently diminished as game farming in the area displaced irrigation.



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1986. The exact amount would depend on mining methods but the report saw 16.4 Mm³ as adequate for future demand from mining.

The dam would be an intervention, with far reaching consequences, in a natural system that had evolved over geological time. The Mokolo harvests most of the rainfall in the Waterberg Mountains and delivers it to the plains down a seasonal river prone to occasional floods. In the lower reaches, a large body of water is stored within the sand river bed and adjacent alluvial aquifer.³⁶ Local farmer Willie Loots says the river sand bed is up to 6 m deep with clay lenses that perch the water in the sand and a clay bottom beneath the sand. On either side of it, according to water researchers, the “alluvium with a thickness of up to 5 meters with a coarse sandy base is present along the Mokolo River and serves as an important local aquifer”.³⁷

These aquifers and their importance were fully acknowledged in the 1970 planning report for the dam. It said that the river has a total sand volume of 85.6 Mm³ of which 37% can be filled by water – thus 31.3 Mm³. As some water was permanently retained in the sand, the total usable water in the aquifer would be 19.6 Mm³ per year. In addition, the alluvium (around the sand bed) was estimated at 62.5 Mm³ and could contain 23.2 Mm³ of water, of which 15.7 Mm³ could be abstracted. Thus, there was 35.2 Mm³, which is less than the natural recharge and would lead to a slow decline in water stored in the sand. This would necessitate the additional release of 7.8 Mm³ from the dam for irrigation. The cost of building the dam was estimated at R12 million in 1970, but in 1980 had grown to R16 million – equivalent to R408 million in 2018.

Subsequent to the construction of the Mokolo Dam, there was rapid and extensive irrigation development upstream of the dam, supplied from farm dams as well as direct from the river. As a result, the yield of the Mokolo Dam dropped dramatically to an estimated 23 Mm³ a year, according to the Department of Water Affairs and Forestry. By 2004, the Mokolo Dam was used to supply water to the Matimba Power station (7.3 Mm³/a); Iscor coal mine (9.9 Mm³/a); Lephalale (1.0 Mm³/a) and irrigation farmers (downstream of

36 Report on the proposed Mogol River Construction Works

37 Seaman et al, 2013



dam – 10.4 Mm³/a). The allocations did not always reflect actual use. Irrigators used 16 Mm³/a, while the Grootegeluk mine did not use its full allocation. However, the dam’s water was fully allocated.³⁸ [See table 3].

The dam was to remain the property of the Department of Water and Sanitation (DWS) while Iscor distributed the water. The expectation was that 77% of the capital cost of building the dam would be recovered in this way, according to a report released in 1980, shortly before the completion of the dam. The other 23% was arguably a subsidy to the parastatal Iscor, which was then passed on to the private company, Exxaro. Iscor built the pipeline and pump station to supply water to the coal mine. The pipeline would also be able to supply “a possible thermal power-station of more than 1 200MW with dry cooling”.³⁹

The building of the dam started a slow process of degradation of the river. The dam prevented the occurrence of the previously huge, if rare, floods out of the Waterberg Mountains, which would periodically clear the sand bed of reeds and other encroachments. Soon the reeds would become a problem that the DWS tried to address through chemical spraying.

Building Matimba

Matimba was built, in the first place, to burn the middlings coal from the Grootegeluk mine. It was planned as a ‘three pack’ but, according to Meyer, Iscor persuaded Eskom that there would be enough coal and water to expand it to a 4 000 MW ‘six pack’, three times bigger than first planned.

Matimba was also the result of Eskom’s experience of trying to keep up with ever growing demand from the big gold mining corporations over the two previous decades. It was one of five coal-fired power stations that Eskom built in the 1980s. The initial plan was to locate it on the Eastern Highveld and to call it ‘Ilanga’. The other four were Lethabo, near Sasolburg in the Vaal, and Tutuka, Kendal and Majuba, all on the Eastern Highveld where there were already eight power stations. The aim of the R65 billion programme⁴⁰ was to “treble

38 DWS 2015. Literature Review for Limpopo Water Management Area North Reconciliation Strategy.

39 DWA, *Supplementary report: Mogol River Government Water Work (Hans Strijdom dam)*, 1979: 8,

40 In 1982 Rand – equivalent to R1,263 bn in 2018 Rand.



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its capacity to 70 000 MW” between 1971 and 1992 [Steyn 2006: 19]. Politics counted for more than money, and Eskom managers were more anxious about avoiding an electricity shortfall than about wasting money, argues economist Grové Steyn. He describes how “... during the late 1970s and 1980s Eskom planners consistently over-estimated demand growth for the 1980s and beyond” [2006: 22]. Consultants warned Eskom that its estimates were too high, but it persisted with this extraordinary building programme. Security concerns may have played into this as the power lines from the Cahora Bassa Dam in Mozambique were sabotaged by Renamo, the counter-revolutionary movement ironically supported by the apartheid government to fight against the Frelimo post-colonial government.

While Iscor lobbied for a power station in the Waterberg, Ballim argues that the Eskom board was also under pressure from “the Chief Air Pollution Officer of the time, whose portfolio fell under the ambit of the Department of Health. The Air Pollution Officer was concerned about the concentration of sulphur dioxide (SO₂) in the Eastern Transvaal ... and ... refused to grant Eskom permission to build the power station there” [2017: 99]. Ilanga was thus ‘relocated’ to the Waterberg and renamed Matimba. With this, Eskom could continue to pump out SO₂ without restraint, not only in the ‘under polluted’ Waterberg (see later in this chapter), but also on the Eastern Highveld.⁴¹ The station could be located there because the centralised electricity grid (since 1973) allowed electricity to be generated far from the centres of demand. Conversely, Grootegeluk and Matimba brought the electricity grid to the remote village of Ellisras. The mega project thus re-orders space in real and imaginary ways.

Water on the other hand was acknowledged as a restraint, and led to the decision to build Matimba as a dry-cooled power station. According to Eskom,⁴² a conventional wet-cooled power station loses approximately 85% of the total quantity of water supplied to it through its cooling towers. Matimba makes use of closed-circuit cooling technology similar to the radiator and fan system

41 See The groundWork Report 2017 for an account of pollution on the Highveld.

42 http://www.eskom.co.za/OurCompany/SustainableDevelopment/Pages/Reduction_In_Water_Consumption.aspx



used in motor vehicles. Eskom claims that overall water use is approximately 15 times lower than in a wet-cooled plant with consumption in the order of 0.1 litres per kWh of electricity sent out, compared with about 1.9 litres on average for the wet-cooled stations. This comes at a cost, however, as a dry-cooled station is less efficient and has higher capital and operating costs.

This decision meant that Eskom was planning to build the largest dry-cooled coal-fired power station in the world (at 4 000 MW). It had had experience earlier with smaller dry-cooled power stations – in Namibia (then South West Africa) and with two 200 MW dry-cooled generating sets at Grootvlei. Matimba therefore ticks another mega project box, by using a first of a kind technology at such a scale. This posed major engineering challenges, according to Eskom’s Alec Ham,⁴³ which were tackled through research at the University of Stellenbosch and the Water Research Commission. Amongst other things, they needed to understand the impacts of local weather conditions, the risk of hot air re-circulating through the cooling system, as well as the risk of a heat bubble – of up to 4°C – forming around the power station and affecting performance. This led to hard choices between different engineering options and to time delays in construction. For example, “the positioning of air cooled condenser was our biggest headache,” according to project manager Lionel Tessendorf.

Again because of water constraints, Matimba site manager John Begg said they designed the power station as a “zero liquid discharge station. All its cleaner waste water would be purified and re-used. The water which is too dirty for re-use is piped to storage and used, for example, for ash-wetting. This concept ensures that there is no run-off into rivers or streams to cause pollution, and again it’s a first for Eskom.”⁴⁴ Other technical challenges included the boilers and the quality of the coal. Some of these challenges came back to haunt Matimba in the early 1990s. Notably, a six to seven metre crack developed in a boiler exhaust duct, as a result of mistakes made during construction, and impeded the power station’s performance.

43 Eskom general manager, engineering, quoted in Engineering Week’s Supplement: Project of the Year’87: Matimba power station.

44 John Begg in Engineering Week’s Supplement: Project of the Year 1987: Matimba Power Station.



Finding the funds

Financing the building of seven Eskom power stations between 1971 and 1992 was a major challenge. The 1976 Soweto uprising made international finance impossible so Eskom relied on a new Capital Development Fund financed from sharp tariff increases – a near doubling in tariffs over a period of five to six years, according to Steyn [2006]. This made Eskom unpopular with consumers – big industry and the white population – and, in response, it grew a thicker skin.

In the early 1980s, however, fortune turned in Eskom's favour. The global power station construction market was oversupplied with parts and services and the Northern country export credit agencies supported suppliers in response to industry pressure. According to Ballim, "for the Matimba power station in particular, Bonn had guaranteed R341 million worth of turbine and generator sales to South Africa" [2017: 105]. Contracts for Matimba had a strong international flavour. "Matimba has turned out to be a predominantly German station, with French, Swiss and Scottish contractors participating," said Begg. But "80% of the equipment" was manufactured locally, which Johan van der Bergh, assistant general manager of Engineering at Eskom and responsible for the Matimba project, described as an instance of "technology transfer".⁴⁵

In response to industry lobbies following Eskom's tariff hikes, government appointed the De Villiers Commission to investigate the utility. It convened as Matimba was being built. In his analysis of the commission's findings, Steyn identifies a number of logics in the Eskom situation which bear the marks of mega projects: "... the shifting of financing and business risk onto Eskom's consumers and the state, greater pecuniary ... benefits for managers associated with larger, more complex, and thus economically more risky projects, and information asymmetries with respect to stakeholders about the true risk exposure of these investment decisions" [2006: 32].

45 Both in Engineering Week Project of the Year 1987



Mega project management

Co-ordination is important in a mega project where a range of contractors, providers and manufacturers need to be drawn together, fit into timelines, as well as physically fit the pieces into one big power station. “Co-ordination is all-important”, said Begg. “... at Matimba, I have a technical staff numbering just over 40, who as contract supervisors, monitor contractors’ performance on site through surveillance checks and audits...” They co-ordinated interfaces between different contractors, as well as use of space on the construction site. Project progress was tracked through a computerised project management system provided by Chase Management Systems. “During the pre-planning stages, the system keeps tally of all equipment, tools, materials and personnel required for specific contracts. After site work or when construction begins, it also keeps track of all drawings and documentation, and constantly monitors progress to quickly highlight trends that could lead to time or quality problems...”⁴⁶

Onverwacht and the Ellisras municipality

Iscor created two new townships, Onverwacht and Marapong. Onverwacht was proclaimed in 1985, before there was a municipality. The town council of Ellisras started functioning in 1986. It did not have officials, so it took over some officials working for the old Peri-Urban Health Board.⁴⁷ The municipality did not have offices either, so it built a civic centre in Onverwacht, which it occupied in 1986 and 1987. In 1988 they recruited a full complement of staff, including urban planner Dries de Ridder. He describes the origin of the town’s disjointed spatial form:

Iscor established this town. The original plan was that the old village – the small settlement of Ellisras – would be developed. But in the past, with subdivision of farms to give each one access to the river, you have many long narrow pieces of land running down to the river. They could

⁴⁶ Advertorial in Engineering Week Project of the Year 1987.

⁴⁷ The Peri-Urban Health Board was established in 1943 to take responsibility for areas developing an urban character, but without municipalities or services. It worked in Ellisras through a local health committee.



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not find a way to establish a compact town there. Prices were very high, they struggled with land owners. So they decided to settle on the farm of Onverwacht. They paid George Wells, the owner, R50 000 for the whole farm.

Iscor did the planning for whole town. When Matimba arrived in the early 1980s, they agreed that certain stands will be sold to Eskom and some retained by Iscor. All buildings with flat bar burglar bars belonged to Eskom, those with round bars belonged to Iscor. From there everything else followed. Businesses came and the government built a hospital.

In order to attract and keep middle and senior staff in such a remote town, Iscor created a wide range of sports facilities, including for rugby, squash, tennis, judo and many others at the Mogol Club. A golf course meanders through Onverwacht.

The late apartheid challenge of Marapong

Marapong means “place of bones”. Who was it named for? During the diggings for the Grootegeluk mine, a number of human bones were found. They could have been people coming to look for work, freedom fighters from across the border, or simply people who got lost, according to local traditional healer Lazarus Seodisa. One set of bones was identified as that of Sara Moloantoa from Seleka, who had gone missing during Christmas 1953. “[I]t was thought that she had lost her way” in the “deep darkness” of a Bushveld night [Ballim 2017: 150].

Initially, black workers at Matimba and Grootegeluk had to travel daily on buses from Ga-Seleka, nearly 90 km away, and were looking for ways to stay closer to work, save money and avoid the daily journey.

Back in 1973, Iscor’s feasibility study had already planned to build a township with married quarters on the farm Grootestryd – the farm on which Matimba would be built. According to Ballim it was planned to consist of “a hostel for



single males on the Grootestryd farm and... accommodation for 3% of African employees on a family basis” [2017:86]. In 1980, at the start of construction, the Matimba personnel manager wrote a memo emphasising “... Eskom’s policy of elimination of racial discrimination and the recommendations of the Riekert Commission of Inquiry of 1979, which, inter alia, provides for the greater mobility of the black labour force on the condition that the worker has employment and suitable accommodation” [quoted in Ballim 2017: 113]. Privileged black workers would be settled, according to Riekert’s strategy, in permanent black residential areas. This would support the larger strategy of creating a black middle class to serve as a buffer against radical demands by black workers and peasants. Hence, it was not designed to include all black people but, limited as it was, this strategy would destroy the rationale for Verwoerd-style apartheid.

On the ground in what was to become Marapong, the first construction camp went up in 1977, just down the road from Grootegeluk and right next to the site where Matimba would be built. When construction started on the power station, another two big contractors’ camps were established nearby. When they completed Matimba, according to De Ridder, one camp was demolished – and rebuilt much later for the Medupi construction – while another, which belonged to the then Transvaal Provincial Administration, “was just abandoned ... and became a squatter camp. It was a mess”.⁴⁸ Iscor’s camp was upgraded for the married workers and their families, but the rest of the workers commuted from Ga Seleka.

Kamatuuu Kandorozi was closely involved in the history of Marapong from the start. In 1979, he started working on the construction of Grootegeluk as a labourer. He worked his way up to become a clerk in the mine’s human resources department. In 1983, he took a job as a human resources officer at Eskom. He was also a political activist in the civic and labour movements – a NUM shop steward and a leader of the local ANC team negotiating the new local government dispensation. In 1995, he was elected to the transitional council and he became the first black mayor of Ellisras in 1998.

48 Interview with De Ridder, 19 April 2018



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On his account, Marapong became a township because employees could only access Eskom's housing subsidy scheme if the property was located in a municipal area that would provide them with title deeds. Black employees at Matimba were therefore excluded, as the Ellisras town council refused to allow a black township because "they did not want another Soweto here". Eskom then persuaded Iscor, which already owned Marapong, to go through the process of declaring it a township. "It was not our choice to have Marapong there," says Kandorozi. "We wanted to develop in Onverwacht. But we black people were impatient to wait, so we built in Marapong."⁴⁹

The idea of a black township faced stiff opposition from conservative whites. The local commando, which had existed in various forms since Voortrekker times and was then mobilised for the apartheid regime's border war, drew up a petition against the black township. It was signed by half the white townsfolk. The commando was supported by the local farmers' union (Distrik Landbou Unie), the local member of parliament and leader of Conservative Party (CP), Andries Treurnicht, and the Herstigte Nasionale Party (HNP). The CP was a right wing breakaway from the ruling National Party and the HNP was even further to the right. White Waterberg was a stronghold for authoritarian, if sometimes paternalistic, white conservatism and racism.

On Ballim's account, the white farmers' union argued that it had "... concerns over the availability of water in Ellisras to service the needs of the township dwellers. It also argued that land consolidation in the homelands was enacted in part to prevent the need for a black township in Ellisras" [2017:115]. The commando argued that a black township would lead to labour scarcity on farms, and that "efforts at reform should focus on improving the bus system from the various homelands to Ellisras" [116]. Iscor also at first resisted Eskom's idea, for fear of upsetting the local white elite, but later agreed. Eskom's engineers worried that Marapong would pose a safety risk – being next to the power station – but did not register any concerns about pollution. However, an alternative of creating a black township on a new site to the south

49 Kamatuaa Kandorozi, interviewed 16 April 2018.



of Ellisras was rejected on the basis of excessive cost “because the site would have to be developed as a township from scratch” [Ballim, 2017: 115].

The farmers’ union and the commando were finally defeated by an alliance between Eskom, Iscor, two cabinet ministers – FW de Klerk and Chris Heunis – the two local chambers of commerce, and the new town council. The extreme right fraction of the local white elite had been trumped by a reformist Pretoria, while another fraction welcomed increased business opportunities regardless of colour. The township was established in 1991, just as Matimba was completed.

The boom and the bust

Matimba created a major construction boom. Dreyer estimates that there were between 10 000 and 12 000 construction workers at the peak. Ballim records that 5 000 labourers were housed in Eskom’s “massive” hostel [2017: 163]. More workers were bussed in from Lebowa and skilled artisans had separate accommodation on site. White construction workers, including a large contingent from Germany, were housed in Onverwacht. By 1987, the first unit was in operation and the ‘demob’ in sight. The power station manager, Gert Strydom, then estimated that “1 600 people will run Matimba, when completed in 1991, down from earlier estimated 2 000 people”.⁵⁰ These numbers subsequently shrank again. In 2010, according to Hermanus, the plant employed 950 people – 600 on permanent staff and 350 full-time contract workers [2010b: 20]. In 2017, in response to a request for information, Eskom said there were 476 employees at Matimba.⁵¹ This presumably excludes contract workers.

As construction got under way, the area boomed, as shops, banks, primary schools, secondary schools and a technical college were built. Kandorozi recalls that the Matimba boom had a big impact on town: “There was an improvement in shopping complexes. The shops at the Lephalale Crossing were developed. Machauka Lodge was built and the Palm Park Hotel was improved. Municipal

⁵⁰ Engineering Week Project of the Year 1987.

⁵¹ Eskom, CER PAIA query 10637, 6 October 2017.



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offices were built and much of the money went into Ellisras. The industrial area was built. And the whole of Onverwacht. The Bosveld School was built, the Mogol Club, and the 18-hole golf course ... on land that should have been for black people.”

Black people did not benefit from the boom, says Kandorozi. “When the construction of Matimba started, it was done by construction companies coming from Johannesburg such as Babcock. Even the employment was not for local people and very few were employed as labourers. Pay for local labour was very low, at about a tenth of urban rates. White people in Ellisras opposed higher wages, partly to stop people leaving the farms for higher pay on the construction.”

Trade union activity was slow to reach Lephalale, even though the Congress of South African Trade Unions (Cosatu) was formed in 1985, and Lephalale workers had contact with unionised workers from Thabazimbi, Mpumalanga and the Vaal. In the late 1980s, both the National Union of Mineworkers (NUM) and the National Union of Metalworkers of South Africa (Numsa – formed in 1987) began organising workers in Ellisras. Ballim concludes that “it was only with the formalisation of trade union engagement during the 1990s at the Matimba power station that African workers were able to enter into negotiations with management on an equal footing” [Ballim 2017: 146]. However, workers were not quiescent. In 1971, workers who had mainly come from Iscor in Thabazimbi, went on strike to protest low wages of 50 cents a day. In 1981, there were protests around the demand to convert single hostels into married quarters, so workers’ families could live with them. The parastatals responded by implementing strong access controls, made easier because there was – and is – only one road into Marapong.

According to Kandorozi there was corruption while Matimba was built but, in contrast to Medupi, “corruption was silent with Matimba. Things like transformers were sold three times. White construction workers became rich and went on to establish their own businesses. Matimba was built under the international sanctions regime. The financing was said to be from Iscor and Eskom, but that was not all true. Later we saw it in the apartheid debt.”



When Matimba was completed, De Ridder observed the sharp contraction in the local economy. “A lot of contractors moved out and 500 to 600 houses were standing empty in town. Next to Matimba, the prefab houses that had provided accommodation for the contractors were empty. The whole of Extension 29 was empty. The value of houses dropped, businesses closed down and lots of jobs were lost. It took years to absorb the surplus houses. We undertook initiatives to establish an industrial area and get people moving in to create jobs again.”⁵² Did the industrial area succeed? According to De Ridder:

We maybe caught a few fools... We thought we would have a bigger impact, with a lot more employment opportunities with support from the big role players. We negotiated with Iscor and Eskom to get their support, in the form of local procurement, to keep the money here. We explored with the railways to support the development of manufacturing and agricultural opportunities in the area by providing cheaper rail transport. We argued, ‘Why take a caterpillar machine to Johannesburg if there is a workshop here? Service the machine here.’ Local business people even agreed on percentages of profit margins. But the two big parastatals did not play their part in local development. They did not support small businesses like the hardware shop. They bought 1 000 bags of cement at a time in Pretoria. They still procured everything from Pretoria.

The boom consolidated the pre-existing apartheid geography based largely on daily migrant labour, as black workers were forced to commute every day from the Seleka and Shongwane areas of the Lebowa bantustan (also known as Mokerong 1) 90 km away. Those who made it into the new black township that had grown from the construction camps, were forced to live in the polluted shade of Matimba by the dying power of the conservative white elite of old Ellisras. Marapong residents talk about the pollution they experience. They watch the plume of pollution from the stacks, especially the thick black smoke during maintenance shutdowns, the black clouds of coal dust from the stockpile and the mine, and the white dust clouds blown off Matimba’s massive ash dump.

52 De Ridder interview, 19 April 2018.



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Exclusion from decision making – already established under the harsh rule of apartheid state and the Minerals Energy Complex – was intensified by the mega project, by the sheer size and therefore distance from decision making, as well as by the characteristic traits of over-promising, under-delivering and going far over budget. In these circumstances, decision-making processes are driven by what Flyvbjerg calls the ‘four raptures’ that characterise mega projects: the technological, political, economic and, sometimes, aesthetic sublimities. However, as we will show, activism that defends both the global environment from climate change, and local environments from externalities of pollution and other social-environmental injustices, has managed to reach into, and bring to heel, some of these rapturous plans.

The capture of resources by an industrial mega project is illustrated by the fate of the Mokolo River. Harvesting the greatest portion of rainfall from the Waterberg, it was harnessed in support of industrial development. Iscor and Eskom engineers met the challenges of low quality coal by constructing the largest coal washing plant in the world and building the then largest dry-cooled coal fired power station in the world – a technological sublime. The parastatal managers prided themselves on financial innovation and tight project control delivering on deadline. Their work in assuring steel and electricity production was part of apartheid South Africa’s defiance of international pressure. This political sublime was backed by the demonstration of technical virtuosity, even though the risks taken during construction resulted in lower productivity as technical failures, like the welding on boiler ducts, led to excessive periods of down time in the early 1990s.

Both Eskom and Iscor managers expressed pride in their approach to the environment. During the construction of Matimba, contractors were fined for damaging trees⁵³ and game animals were brought onto the land bought to create buffer zones.⁵⁴ But the bigger questions of environmental degradation set in train by these developments go begging. There is silence on climate change and precise information on the impacts of SO₂ pollution are elusive. Meyer says there has been extensive research into air pollution, “but the results were

53 Engineering Week 1987.

54 Joe Meyer interview, September 2018



inconclusive”. Some researchers talk about air pollution affecting a downwind strip of land where few people live and argue that the municipality should never settle people there. There are many references to ongoing spontaneous combustion from the discard dumps, starting from the 1980s [Gilliland 1982; Muthige 2013; Deysel 2015]. Noting that 95% of the sulphur in the coal is emitted to the atmosphere, researchers have argued that the sulphur content of the coal will make it difficult for the power stations to comply with emission standards unless flue gas desulphurisation (FGDs) units are installed [Makgato and Chirwa 2017]. We take up these issues in the next chapter.



3

Boom Two

Neo-liberal policies were first initiated by the apartheid government in the 1980s, partly as a response to having been caught in a debt trap. South Africa borrowed heavily on international markets in the early 1980s at a time when the US was pushing up interest rates. In 1985, Eskom found itself cut off from international credit and in 1986 the South African government defaulted on its debt. Iscor was privatised in 1989, partly to pay down debt and fund the last years of the apartheid regime and partly for the presumed benefits of managerial efficiency.

Privatisation of Eskom was also debated but, according to Ballim, the then “government prioritised operational efficiency over an actual transfer of ownership” [2017: 118]. In 1989, President PW Botha was ousted by his cabinet in a palace coup to open the way for negotiations with the ANC and on a political transition from apartheid. It was then thought that privatising Eskom “would be viewed as an act of bad faith” [126]. Nevertheless, the debate on privatisation “continued until 1992 when South Africa was largely out of the red” [121].

Ironically, the neo-liberal agenda was consolidated by the first post-apartheid government with the 1996 Growth, Employment and Redistribution (GEAR) economic policy – which was misnamed since it produced little growth, substantial job losses and rising inequality. Following the logic of GEAR, government’s 1998 White Paper on Energy proposed privatisation on the assumption that ‘the market’ would lead the action to create economic growth and jobs. It predicted that new power plants would be needed by 2007 but said that building them should be left to the private investors. Eskom then found itself defending against proposals to break up its generating monopoly



into supposedly competitive bundles to be sold off to the private sector and to hand the grid over to a separate state entity. Its arguments were supported by the real heart of the energy policy – the long term commitment to cheap energy for industry as the foundation of international competitiveness. While government barred Eskom from planning new plants, and Eskom disbanded its experienced build team, private investors were not interested for as long as there was no price escalation in prospect.

In Lephalale, meanwhile, the local transition was under negotiation as described in the last chapter. But the basic economy of the town created to service Grootegeluk and Matimba looked more or less fixed and, as De Ridder observed, various initiatives for economic expansion beyond that were still born. The decision to build Medupi – 15 years after the Matimba bust – initiated the second boom and changed the outlook. It was introduced with high political rhetoric and induced ambitious visions for Lephalale's future.

This chapter looks at how ambition has foundered. It looks first at the privatisation and break up of Iscor and the making of Exxaro as a black owned mining corporation. Next, it describes the genesis of the project, its shaky foundations and shakier finances, the false promises befitting of a mega project, the heavy environmental impacts and the consequent clash of capital and state with environmental justice organisations. It then describes boom town Lephalale, on a rising tide that sank more boats than it lifted, the disarray on the neo-liberal construction site and the social costs visited on local communities.

Iscor breaking up

Iscor was privatised for R3 billion in 1989 as part of the late apartheid strategy of liberalising the economy. The big buyers were finance capital, with Standard Bank Nominees and Mutual Life holding 26% and 10% respectively in 1996. Government also retained a large share through the Industrial Development Corporation's (IDC's) 15%. In 2001, the mining division was split off to form Kumba Resources and snapped up cheaply by Anglo American.



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South Africa provided a low cost base for steel production. Apart from scrap metal, all the inputs were cheap and remained so through to 2008: energy was as cheap as it gets; labour costs were less than half the world average; high quality iron ore and coking coal was available from Iscor's own mines and was subsequently bought cheaply through long term deals with Kumba.

Despite this, the privatised Iscor was in trouble. Part of its problem originated in the apartheid state's concern for security of supplies in the face of growing isolation. It produced too many product types requiring high-cost short production runs and its gross inefficiency resulted in a high proportion of defective product. Government bailed it out with over R1.2 billion in subsidies between 1992 and 1996 on top of a 30% import tariff protection.⁵⁵

From 1994, Iscor shut down 2.5 million tonnes of capacity, halved the number of grades produced, slashed tens of thousands of jobs and reorganised its marketing to support exports at the cost of the domestic market. In 1996, government reduced the tariff protection to 5% in order to cut costs to downstream manufacturers, and car makers in particular, and so promote export-oriented manufacturing.

Steel bust in Saldanha

In 1995, Iscor and the IDC embarked on a joint project to build a new steel mill at Saldanha Bay. This mega project was made the 'anchor' of government's spatial development initiative (SDI), supposed to kick start economic growth and job creation in the area. In fact, it produced a boom and bust cycle. High labour demand during construction attracted workers from outside the area but, once complete, the plant provided relatively few jobs. The overall effect was to increase the local unemployment rate.⁵⁶

Saldanha Steel was planned as a 'lean mill' with cutting edge technology aimed at the export market. It started producing in 1998 but the timing was exactly wrong. Large steel surpluses came onto the market as the result of the IMF

55 Interview with Zav Rustomjee by Victor Munnik in May 2006. See also documents on the Competition Tribunal's website www.comptrib.co.za.

56 See The groundWork Report 2003 [68ff] for a critique of spatial development initiatives.



induced 'Asian crisis' and new production in China, South Korea and Brazil added to the surplus. The international price of steel collapsed and domestic demand, at around 4 000 tons compared with the nearly 5 000 tonnes of the early 1980s, did not compensate.

Iscor and IDC each held 50% of the shares in Saldanha Steel. By 2000, the venture was bleeding cash from both corporations. It accounted for 65% of the IDC's portfolio and threatened its very existence. In panic, the IDC came up with two strategies. First, in 2001, it drove the process of 'unbundling' Iscor by splitting off Kumba Resources. Iscor opposed this move and then tried to saddle the Kumba with its massive debts. It failed on both counts but did get a guaranteed low cost supply of iron ore and coke from Kumba and 100% of Saldanha Steel. Next, IDC looked for an international investor to bail it out. It found Lakshmi Mittal, a tycoon who was building a global empire by buying out cheap, dirty and inefficient steelmakers hit by the price collapse. His atrocious environmental record did not register as an issue with the IDC.

A fire sale doesn't quite describe it. They paid Mittal to take it away. The unions contested the takeover as they anticipated that Mittal would cut more jobs. Investors, in contrast, lauded the high profits managed by Mittal. Government supported Mittal's takeover of Iscor on a 'gentleman's understanding' that the benefits of cheap inputs would be passed through to local manufacturers. Instead, Mittal milked money from the South African steel industry through import parity pricing, charging local customers over 60% more than it charged for export steel [Roberts & Rustomjee 2009].⁵⁷

Kumba

While giving the steelmaker away to a transnational corporation, the IDC saw Kumba as an appropriate vehicle to make good on black economic empowerment. It retained 14% of Kumba's shares and expected to effectively control it through an agreement with Stimela, a company owned by the disreputable Israeli businessman Beny Steinmetz, with 10%. Anglo, meanwhile, had already acquired 10% and, in early 2002, bought Stimela

⁵⁷ See The groundWork Reports 2006 and 2017 for more on the takeover by ArcelorMittal.



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outright and so established control with 20% of Kumba – much to the chagrin of the IDC. At the same time, Anglo bought AngloVaal Mining (Avmin), which owned iron ore mines adjacent to Kumba’s Northern Cape mines at Sishen. The next year, it increased its holding to 67%.

Anglo’s primary interest was in the iron ore rather than the coal. It was already in talks with government on black empowerment and, in 2001, Anglo and BHP Billiton had put together a portfolio of coal mines to create Eyesizwe as a BEE partner. Following the takeover of Kumba, Anglo repaired relations with the IDC, which remained a substantial shareholder. The two then cooperated to create a substantial black owned company by splitting off Kumba’s coal and base metal mines and merging these assets with Eyesizwe to form Exxaro. Anglo’s Kumba Iron Ore and Exxaro were then separately listed on the Johannesburg Stock Exchange in November 2006.

Exxaro was, said Anglo, “South Africa’s biggest ever BEE company”. Anglo retained a substantial 17% minority shareholding and a place on Exxaro’s board while Exxaro took 20% of Kumba to become Anglo’s major BEE partner.⁵⁸ A controlling 53% share was held by ‘BEE Holdco’ which was in turn controlled by Eyesizwe – subsequently called Dreamvision Investments – with the IDC as a minority shareholder. Major BEE shareholders included the then Exxaro CEO, Sipho Nkosi, and Mxolisi Mgojo, a senior executive who has succeeded Nkosi as CEO. Shares in BEE Holdco were ‘locked in’ for ten years – meaning that the holders could not sell before November 2016. This prompted fears that a sell-off of Exxaro shares would leave it with less than the required BEE rating.

Exxaro therefore managed a process to ‘unwind’ the previous BEE structure and create a ‘NewBEECo’, partly funded by Exxaro buying back about R2.7 billion worth of its own shares – which were then cancelled – and buying R2.5 billion in NewBEECo. Following this rather complex set of deals supported by the IDC, NewBEECo is composed of Exxaro itself with 25%, the IDC with 23% and a BEE consortium with 52%. This consortium is in turn dominated by Dreamvision. NewBEECo holds 30% of Exxaro, considerably less than the

⁵⁸ Anglo Press release, *Anglo American subsidiary Kumba Iron Ore lists on the JSE*, 20 November 2006.



53% held by BEE Holdco. Rather confusingly, but as if to bring things full circle, NewBEECo has been renamed as Eyesizwe (RF) [Exxaro AR 2018: 102]. These deals have thus transferred substantial wealth to ‘empowered’ black capitalists while also ensuring that Exxaro retains control of the company.

The developmental state’s strategic investment

The privatisation policy was suspended in 2004 as government adopted the rhetoric of the developmental state and said that Eskom, Transnet and Denel were strategic enterprises that would lead public sector investments to stimulate growth. At the same time, Eskom’s ‘spinning margin’ – the difference between peak demand and overall generating capacity – was shrinking as government continued to push investments in energy intensive industries. In February 2005, Alec Erwin, then Minister of Public Enterprises, announced that “R107 billion will be needed between 2005 and 2009 to meet the country’s growing energy needs. Eskom will invest R84 billion over the next five years. The balance of R23 billion is reserved for independent power producers (IPP) entrants”.⁵⁹ No IPPs came forward and the instruction to Eskom was too late already. As Trollip et al [2014] point out, it previously took Eskom at least nine years to build the big ‘six pack’ power plants favoured by Eskom and, to meet the deadline, the decision to build should have been made by 2000. The lights duly went out at the end of 2007, mere months after construction started at the Medupi site.

Having started late, Eskom cut corners. According to former CEO Brian Dames, Eskom did not have a clear funding plan and the delayed decision to build new plant “meant we also had little opportunity to complete all the upfront planning”. The Medupi project ran into problems almost immediately, with “unexpected geo-technical challenges”.⁶⁰ In other words, they had not done a proper survey of the land and had to redesign the foundations to carry the massive weight of the plant.

59 Minister Alec Erwin, ‘Economic Cluster: Higher Growth, Sustained Growth, and Shared Growth’, Parliamentary media briefing, 17 February 2005.

60 Brian Dames, *The lessons Eskom learnt the hard way*, Infrastructure News, 17 September 2013.



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Dames continues, “Back in 2005, when the Eskom board approved what was then called Project Alpha, the first unit [Unit 6] was due to come online in September 2011.” The geo-technical ‘challenge’ delayed the target date to December 2012. Next, in 2011, massive structural steel members arrived at the site on the back of abnormal load trucks but it was then discovered that the wrong drawings had been used to make them. Unit 6 completion was then put back to the end of 2013. Then “underperformance by key contractors” added another year. In particular: Hitachi messed up on the boilers and thousands of welds were found to be defective and had to be redone; the standard of Alstom’s instrumentation was disputed and the company was moved off the job at considerable cost to Eskom.

Five years later, the problems persist to the extent that Medupi’s coal consumption might be reduced. Grootegeeluk managers are concerned that the plant may have a lot of downtime and/or will run at less than full capacity, according to the former mine manager Joe Meyer. Such apprehensions were confirmed in late 2018 when Eskom reintroduced load shedding. Eskom had, once again, neglected maintenance on its older plants in anticipation that Medupi and Kusile would take up the strain as the units came on line. But these units are underperforming, according to Gordhan, now minister of Public Enterprises. He said there were problems with the work of several major contractors and particularly with the boilers supplied by Hitachi. He also noted problems with the fabric filters, which suggests that pollution control is faltering.⁶¹ Ironically, as recounted below, Gordhan is now dealing with the consequences of decisions that he himself championed.

The project has also been subject to long-running labour disputes with a major strike in 2013. Poor management of labour relations is also reflected in the burgeoning numbers. Initial planning indicated that the number of construction workers would peak at under 8 000 – similar to the number employed on the Matimba construction. That number more than doubled to 18 000 in the formal account and up to 21 000 in informal accounts. Clearly,

61 Terence Creamer, *‘Treasonous’ tweets won’t help Eskom out of current ‘crisis’*, Engineering News, 6 December 2018.



there was no accurate count.⁶² The project was also slowed by a shortage of skills in project management and supervision as well as welding. Another year was added before Unit 6 was brought on line in 2015.

By then, Dames was gone – he later revealed that he had received death threats.⁶³ His successor Tshediso Matona was also gone – having been muscled out – and Brian Molefe arrived in the CEO’s chair just in time to take the credit. He too was gone within a year as his complicity in state capture, and particularly the capture of the Optimum coal mine, was made public in a report by the Public Protector. Acting CEO Matshela Koko then kept the seat warm for five months before Molefe made a surprise, but short-lived, return in May 2017. More acting CEOs followed.

The churn of CEOs echoed the churn on Eskom’s board and in Jacob Zuma’s cabinet, documented in detail in the groundWork Reports of 2016 and 2017. The battle for leadership of the ANC was meanwhile in full swing. In December 2017, Cyril Ramaphosa won the presidency of the party and two months later he ousted Zuma from the national presidency. Installing credible leadership at Eskom was a priority as the scale of its debts, guaranteed by the National Treasury, threatened to sink the national economy. Eskom’s status was already downgraded to junk in 2015 by the Wall Street credit rating agencies – the watchdogs of global capital – and, in March 2017, South Africa got a junk rating from two of the three agencies when Zuma sacked Pravin Gordhan and Mcebisi Jonas, the minister and deputy minister of finance, in what was seen as a final effort to open the Treasury for looting.

As Dames also remarked, “Costs are rising”. This was something of an understatement. Cost escalations for both Medupi and its twin, Kusile, are shocking – although not unexpected. In 2005, when Erwin announced the new build, the estimated cost of a big “six pack” plant was R30 billion. That used to sound like a lot of money but it has been dwarfed by the subsequent escalation

62 A Medupi Power Station Fact Sheet gives 8 000 while a Medupi Power Station Brochure gives 18 000. Both are dated 2013 on the website. The number of 21 000 was given by LDF coordinator Jacques Snyman, interview 9 April 2018.

63 Kim Cloete, *‘Absolutely no need’ for nuclear, Dames says in State-capture testimony*, Engineering News, 18 October 2017.



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shown in Table 1. By early 2007, Eskom’s R87 billion capital expenditure had risen to R150 billion and six months later then CEO Jacob Maroga said the corporation had approved power generation worth R204 billion, transmission projects worth R15,5 billion and distribution projects worth R25 billion. The ‘new build’ power generation plants included:

- two diesel-fired ‘peaking’ plants;
- three old mothballed plants returned to service – Camden, Komati and Grootvlei;
- Ingula, the new pumped storage plant; and
- Medupi and Kusile.

Table 1: Medupi and Kusile cost escalations

	2005	2007	2009	2010	2014	2016
	Cost without interest			Cost with interest		
Medupi	R30 bn	R79 bn	R100 bn	R125 bn	R154 bn	R195 bn
Kusile	R30 bn	R84 bn	R110 bn	R145 bn	R172 bn	R225 bn

Costs up to 2010 are from Eskom as quoted in various media and exclude flue gas desulphurisation (FGD) at Medupi; 2014 and 2016 are estimates from Chris Yelland and include FGD at Medupi and interest.⁶⁴ Eskom has since updated project costs excluding interest and FGD at Medupi: R145 billion for Medupi and R161 for Kusile.

Eskom was meanwhile demanding ever bigger increases to the electricity tariff to pay for the escalating costs of the new build as well as for rising coal costs. In 2007, it was campaigning for an 18% rise and said that the cost of production from the new coal plants would be 36c/kWh, double the then domestic tariff of 18c/kWh. Allowing for inflation, that would be nearly doubled to 71c/kWh and 35c/kWh in 2018 Rand. The 2018 tariff is 94c/kWh, an increase of 268%. The ‘levelised cost’ of production,⁶⁵ including interest on capital, from the two

64 Terence Creamer, *Eskom moves to explain why coal projects will now cost R211bn*, Engineering News, 23 January 2009; Chris Yelland, *Interview with Eskom finance director Paul O’Flaherty*, EE Publishers; 9 June 2010; Chris Yelland, *Eskom’s white elephants – Medupi and Kusile – dampen electricity price outlook*, EE Publishers, 6 July 2016.

65 The levelised cost is the cost of production over the full life-time of the plant at present Rand values.



mega plants has meanwhile spiralled to R1.70/kWh for Medupi and R1.90/kWh for Kusile, according to Steyn et al [2017: 43].

It should be emphasised that these giant plants were exactly what energy intensive industries wanted. This was the model of the Minerals Energy Complex – big power plants to supply big baseload to big industry. But the model is broken as the Energy Intensive Users Group (EIUG) itself observes:

The traditional electricity industry model of a public utility company building and operating large, centralised power stations worked well in the previously unconstrained world of the 20th century, where bigger was better and marginal generation costs came down because of better fuel conversion efficiencies and economies of scale. However, recently almost all aspects of the traditional approach face increasing marginal costs. This is due, in part, to increasing costs of environmental compliance (for coal) and safety (for nuclear), coupled with the institutional governance and bureaucratic processes inherent of large public utility companies. One needs look no further than the current Eskom expansion plan for examples of serious cost and schedule overruns, and there is no evidence to show that any future mega projects will be different.⁶⁶

This description omits that the 20th century cost of power was also subsidised by the low wages and appalling conditions of labour in the coal mines. Nevertheless, it gives notice that the primary beneficiaries of cheap power are now abandoning the model because it is no longer cheap. Apart from South32's Richards Bay aluminium smelters, which still receive the cheapest electricity in the world at well below Eskom's production costs, the cost of power for big industry increased from under 10% to as much as 30% of total costs.⁶⁷ Hence, the EIUG is now calling for "alternative distributed generation resources" – that is, renewables – while Eskom is broken by the mega project

66 EIUG Comment on the draft IRP2016, March 2017, p.6.

67 Jan de Lange, *SA gold mines are on the brink of death*, City Press Business, 2 July 2017; EIUG website visited at 20 August 2015 www.eiug.org.za.



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investments meant to reproduce the ‘traditional electricity industry’ and is dragging the country into a debt trap.

This is what happened to many third world countries following the ‘oil shocks’ of the 1970s. Finance capital suffered a glut of petro-dollars and, with the World Bank in the lead, rushed to sell cheap loans to Third World governments, mostly for arms or prestige mega projects. In the 1980s, these countries were trapped in debt as the imperial powers drove up interest rates. They were then forced to turn to the International Monetary Fund (IMF) and the World Bank, who bailed them out on condition that they implement structural adjustment programmes.

Back at Medupi, Units 3 and 2 have been completed ahead of schedule. This seems to be because the completion dates have been pushed back far enough to make early delivery likely. Unit 1 comes last and is scheduled for commercial operation in 2021 but we can anticipate it coming in at least a year earlier. But it will still be five years later than originally promised.

Exxaro’s big deal

Just as it was both the construction of Grootegeluk and Matimba that constituted the first mega project, so too the second mega project combines the expansion of Grootegeluk with the construction of Medupi – and is locally called ‘G-Med’. But whereas Eskom’s part was falling apart, Exxaro boasts that its expansion was on time and under budget. Hence, it started producing coal in 2014, before Eskom’s first unit was ready to burn it. Since this is a take or pay agreement, Eskom first paid penalties and then decided to take the coal and stockpile it. The rather bizarre result is that the coal is carried cheaply by a short conveyor belt from Grootegeluk to Medupi and then loaded onto trucks for a costly trip to Medupi’s stockpile a couple of kilometres down the road. Eskom is now trying to negotiate space on Transnet’s coal line to take this surplus of coal to power stations on the Highveld that have run short.

Today, according to Exxaro:



Grootegeluk ... produces 26 Mtpa [million tonnes a year] final coal products [and] has an estimated mineable coal reserve of 3 261 Mt ... Some 22 Mt of annual production is power station coal, transported directly to Eskom's Matimba and Medupi power stations on a 7 km conveyor belt in terms of the existing supply contract. ... Grootegeluk produces 2,5 Mtpa of semi-soft coking coal, the bulk of which is railed directly to Mittal SA under a long term supply agreement. Approximately 1 Mtpa of semi-soft coking coal and thermal coal is exported through Richards Bay Coal Terminal or sold domestically.”⁶⁸

Taking a long term view of the mine, consultants Digby Wells foresee a life of mine of around 60 years – taking it to the mid-2070s. These environmental assessment practitioners are clearly in awe of the Grootegeluk operation and, apparently, unconcerned about climate change:

It is estimated that the pit will reach its most western extent in 2028 – 2032 ... at which time haul distances to the processing plants will be the greatest. After reaching the western extremity, mining will turn back in an easterly direction to recover coal in the north and south limbs of the deposit. The stripping ratio will increase to 1:1; i. e. for each 1 tonne of coal produced, 1 tonne of waste will be moved. It is expected that the new expansions in the form of GG7 & GG8 will increase the total production rate from 84 Mtpa to 120 Mtpa. ... The mining area, consisting of 6 adjoining farms, amounts to a total of 6 528.540 ha. The current open pit area is approximately 844 ha, reaching mining depths up to 115 m and the maximum volume of the pit is predicted to be 575 723 077 m³ [cubic metres]. Although the economically exploitable, saleable coal reserves [are] well in excess of 60 years, the mine's planning is based on a 62 year Life-of-Mine Plan.⁶⁹

68 Description of Grootegeluk mine on Exxaro website

69 Digby Wells, 2014. Grootegeluk Coal Mine Environmental Impact Assessment and Environmental Management Programme (EIA/EMP) Report Section 102 Amendment. P.34 https://www.sahra.org.za/sahris/sites/default/files/additionaldocs/EXX2678_Grootegeluk_Draft_Section102_Submitted_2014-07-15_KG.pdf.



The World Bank rescues Medupi

Eskom was in trouble from the start of the new build. At the start of 2008, the lights went out as Eskom failed to meet demand and started load shedding. That created an air of panic and urgency to the new build. But it was also evident that the utility did not know how it would fund it and the numbers were not adding up. In February 2008, Finance Minister Trevor Manuel gave it a R60 billion loan which was later redefined as equity – that is, not repayable. This was a staggering amount of money, close to what had been spent on the scandalous arms deal. But it barely touched Eskom's ravenous appetite for money to fund the mega projects.

In March 2008, having already been awarded a 14% tariff hike, Eskom asked Nersa to increase that to 60%. This was met with disbelief by all interest groups in the country and stirred up a sustained resistance to Eskom revenue requests. Nersa refused the 60% but still gave it a very hefty 27% increase. This was not enough to satisfy global capital. The ratings agencies wanted to see an electricity price high enough to yield a high return on capital for the expansion. Moody's immediately downgraded Eskom's credit rating by four notches, so raising the cost of capital. The next day, news was fed to the media that Eskom was negotiating with the World Bank for a US\$5 billion loan.

At this time, the meltdown of global capital was gathering pace and credit was made scarce. Lehman's, one of the big five Wall Street investment banks, collapsed in September 2008. The World Bank used the loan as an example of increased assistance to African countries affected by the financial crisis as it tried to reposition itself as a friend-in-need to Southern countries that had long suffered under the yoke of structural adjustment programmes imposed by the Bank under the 'Washington consensus'. In the bank's own words, South Africa had previously regarded it as an 'unwelcome suitor'.⁷⁰ That it was now begging for cash was a political prize for the Bank as it showed that no country could afford to avoid it.

70 World Bank (IBRD, IFC and MIGA), 'Country Partnership Strategy for the Republic of South Africa for the Period 2008–2012', 12 December 2007. p. 4.



In the event, the loan was subsequently fixed at \$3.75 billion: \$3 billion for Medupi; \$490 million for a coal rail to the Majuba power plant; and, as a fig leaf for the Bank's climate credentials, \$260 million for the Sere wind farm and a concentrated solar power plant which Eskom has since cancelled. Since then, the Rand value of the loan has swung between R30 and R60 billion as the ZAR/\$ exchange rate soared and slumped from under R8 to as much as R16 to the dollar.

The Bank said the loan would bring financial stability to Eskom, support future economic growth, contribute to poverty alleviation, and help South Africa onto a 'low-carbon path'. As we remarked at time: "There is nothing 'low carbon' about Eskom's new build. Nor does 'financial stability' seem likely, except perhaps at the cost of the country's stability" [groundWork 2009: 5]. And we recalled that the Extractives Industry Review of 2000, established by the World Bank itself, found "that poverty alleviation was neither the goal nor the outcome of the Bank's lending" [8]. The underlying purpose of the Bank's loans was to extract resources for the global markets.

Additional public finance for the new build included \$3.1 billion from the African Development Bank (AfDB) and \$250 million from the Clean Technology Fund (CTF). Another \$1.7 billion or so was secured through the German and French export credit agencies (ECAs) from private European banks to fund the boilers and turbines for Medupi and Kusile.⁷¹

Treasury stands surety for the loans to Eskom. The World Bank required Treasury guarantees and Manuel's 2009 budget provided for R176 billion of loan guarantees, covering both development bank and private lending. The risk was thus shifted to the public purse. As we warned in 2009, "In taking on the debt, the Treasury is making a double bet: that future economic growth, and the continuous expansion of demand, would more than cover repayments; and that the Rand will hold its value. Otherwise the debt becomes a trap as it did for many southern economies in the 1980s" [groundWork 2009: 28].

71 Northern country ECAs guarantee debt to secure contracts for their home industries – in this case for the boilers and turbines for Medupi and Kusile. They eliminate the risk to banks, effectively taking over unpaid debts, but not to the recipient country. They now hold a substantial proportion of Southern country debt.



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Neither bet looks good. Nevertheless, in October 2010, Treasury made its choice in a game of double or quits. It doubled the guarantee on Eskom's debt to R350 billion rather than call it quits on Kusile which, it appeared, would not otherwise be funded. On top of that, it indicated that it would inject a further R20 billion of equity into Eskom, bringing the total to R80 billion.

Table 2: New Build foreign public loans and credit support: US\$ millions

	Medupi	Kusile	Majuba	Sere	General	Total
World Bank	3 000		490	260		3 750
World Bank MIGA					804*	804
African Development Bank	2 600			365	375	3 340
AfDB Guarantees					1 340	1 340
French & German ECAs	850	850				1 700
French development agency (AFD)				120*	428**	548
US Exim		805				805
New Development Bank					180	180
China Development Bank	1 500	2 500			500	4 500
Total	7 950	4 155	490	745	3 627	16 967

Source: Kigoda 2017 and various news media.

* Converted from Euros at €1 to \$1.2. ** Converted from Rand at R14/\$1.

Notes: 'General' includes funding for the new build as a whole, including transmission. In some cases, funding appears to include support for the renewables programme. Italics indicates credit guarantees for private bank loans rather than direct loans. In some cases, the distinction appears to be fudged.



Private and public national financial institutions are all heavily exposed to Eskom's Rand-denominated debt. In 2010, the Development Bank of South Africa issued a loan of R15 billion for the new build while the Public Investment Corporation (PIC) holds R95 billion on behalf of the Government Employees Pension Fund (GEPF). According to Kigoda, Eskom has faced increasing difficulty in raising funding through bond markets. Its last bond was issued in 2015 and the major holders "were the GEPF (76.64% of the total), Sanlam Life Insurance, the Associated Institutions Pension Fund,⁷² Old Mutual plc, Sanlam Investment Management (SIMLEND), Stanlib, Liberty Life, Sanlam Ltd, MMI Group, and SAMWU National Provident Fund" [2017: 10]. Eskom's total debt now stands at R399 billion.

In January 2018, the PIC bailed out Eskom with a R5 billion short term loan to save it from defaulting. The PIC said a default would have put its own R95 billion government-guaranteed exposure to Eskom at risk. Creditors would have started calling in their loans and the Treasury would have been liable for guarantees of R350 billion which it did not have.⁷³ Eskom is thus widely seen as the biggest risk to South Africa's economy and key to further downgrades by the credit rating agencies.⁷⁴

Box 2: Coal Stain

The World Bank's loan specifically excludes the boilers and turbines for Medupi. The African Development Bank (AfDB) loan is specifically for these components only. The AfDB is to all intents and purposes the World Bank's less scrutinised branch in Africa and the two loans were clearly coordinated. The reason for this split in funding is that Eskom awarded a R40 billion contract to Hitachi Power Africa to supply the boilers for both Medupi and Kusile. They are made by Hitachi Europe which is located in Germany – hence the German Export Credit Agency (ECA) loan.

⁷² The AIPF includes people working at the Legal Aid Board, SA Diamond Board, universities, scientific boards, research councils etc, according to the Government Pensions Administration Agency..

⁷³ Linda Ensor, *Loan pulled Eskom from brink of default, says PIC*, Business Day, 12 February 2018.

⁷⁴ Bloomberg, *SA faces lights out, unless Ramaphosa can fix Eskom*, Moneyweb, 11 October 2018.



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Chancellor House, an investment company set up to fund the ANC, was Hitachi Africa's accredited Black Economic Empowerment (BEE) partner with a 25% shareholding. The ANC consequently got a very large rent off the deal. At the time that the boiler contract was awarded, Valli Moosa was both chair of the Eskom board and on the ANC's National Executive Committee. The Public Protector found that Moosa's conduct was improper in that he did not manage the conflict of interests appropriately. Prior to this finding, ANC Treasurer Matthews Phosa admitted the conflict of interest and said that Chancellor House would withdraw its stake in Hitachi. It did not do so.

The World Bank's procurement rules prohibit lending to projects that benefit a political party. The comfortable arrangement with the AfDB was patently a subterfuge to circumvent the rule. The major European countries and the US are members of the AfDB as they are of the World Bank. It must be assumed that they knew very well what the game was. Once the matter was splashed across the international media, it seems that some heavy diplomacy followed. Within days of the vote, Phosa again promised that Chancellor House would sell the shares but was immediately contradicted by the ANC's then General Secretary Gwede Mantashe. Chancellor House subsequently said that it had no intention of selling its shares.

Four years later, in February 2014, Hitachi bought out the Chancellor House shares. Another year on, in September 2015, the US Securities and Exchange Commission (SEC) charged Hitachi with making improper payments to the ANC in return for support in winning the contracts. Amongst other things, the SEC alleged that Chancellor House, and hence the ANC, benefitted from a \$1 million "success fee" and another \$1 million improperly recorded as a dividend "in exchange for its political influence in assisting Hitachi land two government contracts". In addition, Chancellor House made over \$10 million from dividends and the eventual sale of the shares, a 5 000% return on investment in nine years. Hitachi settled for \$19 million (R266 million) without admitting or denying the allegations.⁷⁵

Source: The groundWork Report 2015

75 United States District Court for the District of Columbia, Securities and Exchange Commission v Hitachi, 28 September 2015.



Resistance to Bank and State

From 2008, when the news that Eskom was negotiating with the World Bank was leaked, Earthlife and groundWork led an international campaign against any deal being signed. The campaign gathered intensity at the 2009 Copenhagen climate negotiations where the Bank was parading itself as the world's leading broker of climate finance. In South Africa, it gained momentum as Eskom demanded yet another steep series of hikes in the tariff – 35% a year for three years – and community groups around the country protested that people would be driven into penury. With the World Bank directors due to vote on the loan in April 2010, 85 South African and African organisations were joined by another 110 organisations from countries North and South around the world in denouncing the deal. In summary, they said:⁷⁶

- It was a bad project, designed to supply cheap power to big industry, that would drive up energy poverty and environmental destruction at the cost of people's health;
- It would burden the country with unaffordable dollar debt, exacerbated by Rand volatility, and that burden would be transmitted to the poor;
- South Africa and Eskom already owed a climate debt to the rest of Africa as it produced more than 40% of Africa's carbon emissions from just 5% of its people;
- The World Bank should pay reparations to South Africa's poor for its odious apartheid era loans to Eskom whereas, to the contrary, its policies of privatisation and cost recovery would result in them being cut off instead of gaining 'access' to electricity;
- That South Africa needed to transform its energy and economic systems to support people, rather than entrenching dirty energy and corporate power;

⁷⁶ Statement from South African and African civil society on Eskom's proposed \$3.75 billion World Bank loan, March 2010.



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- This should start with serious demand side management ending subsidies to big industries, notably the aluminium smelters, and real plans for a 'just transition' for workers and communities.

Government was caught off guard by the intensity of the opposition to the loan and clearly affronted at being challenged by civil society in an international forum. Energy Minister Dipuo Peters called opposition to the loan unpatriotic. Finance Minister Pravin Gordhan misrepresented the campaign as the initiative of northern NGOs who were placing “environmental concerns... above the economic needs of South Africa”. South Africa, he said, had committed to reducing carbon emissions at the 2009 Copenhagen conference on climate change and it had “a very clear plan” to do so. Public Enterprise Minister Barbara Hogan said the country would blackout without the loan and all repeated government’s central message that the economy of the region as well as South Africa depended on it. “A question that has to be faced is whether stunting growth prospects in our region will in any way serve the goal we all share of eliminating greenhouse gas emissions over the long term,” said Gordhan. And finally, they repudiated the suggestion that the loan involved any surrender of sovereign powers to the World Bank. This was a project loan, they said, and there would be no economic policy conditionalities.⁷⁷

The World Bank board finally approved the loan in April 2010 but with four countries abstaining. Nevertheless, Eskom evidently saw the environmental justice campaign as a threat. In 2013, it emerged that Eskom had hired a private intelligence agency to spy on Earthlife, groundWork and Greenpeace as well as on Numsa. The utility was forced to issue a fulsome apology. Eight years on from the approval of the loan, it is clear that the criticisms raised by the campaign were on target. Eskom’s mega projects have brought the country to the edge of default. If it goes over the edge, government will likely be forced to turn to the International Monetary Fund for a bailout with severe economic policy conditionalities.

77 Pravin Gordhan, *Why coal is the best way to power South Africa's growth*, Washington Post, 22 March 2010; Dipuo Peters and Barbara Hogan, *Media Briefing at Imbizo Media Centre*, Cape Town, 12 March 2010; Terence Creamer, *SA would 'cope' should World Bank fail to grant Eskom loan*, Engineering News, 1 April 2010



Environment

Following the Bank's approval of the loan, local community members submitted a request for inspection to the Bank's independent Inspection Panel. The Panel investigates objections made by people who believe their interests will be harmed by a Bank project. The request was made through Earthlife and groundWork and raised issues that have subsequently haunted the project, including the economic consequences discussed above.

Their environmental concerns included:

- Health impacts from air pollution;
- Impacts on water resources;
- The accumulated impacts from existing and proposed projects and the associated expansion of mining; and
- Climate change – contrary to Gordhan's statement, South Africa had no plan to reduce emissions and its actual energy plans were to increase emissions.

Their social concerns included:

- The impacts on people's existing livelihoods, the potential for forced relocation and the destruction of graves and associated cultural practices;
- The question of whom the energy was really for – poor people or big industry; and
- The potential destabilising effect of a large influx of mostly male workers who would themselves be vulnerable to occupational hazards.

In addition, they were concerned that the Bank had placed a heavy reliance on 'country systems' – that is, the capacity and will of the state to act on its social and environmental obligations. In particular, they questioned the capacity of environmental authorities at all levels to hold polluting industries to account. Since then, the non-performance of the authorities has proved the point as the Centre for Environmental Rights shows in the report *Broken Promises* [2017].



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Air pollution

Eskom’s Waterberg power plants are enormous and have emissions to match, as shown in Table 3. Medupi emissions are predicted for when it is operating at full power without sulphur scrubbers. The SO₂ emissions from these stations are much higher than other Eskom plants because the Waterberg coal has a comparatively high sulphur content.

Table 3: Matimba and Medupi air emissions (tonnes)

	CO ₂	SO ₂	NO _x	PM ₁₀
Matimba	22 733 225	309 262	67 592	4 904
Medupi	30 000 000	448 616	61 382	4 092
Combined	52 733 225	757 878	128 974	8 996

Sources: World Bank Eskom Investment Support Project Reports and Matimba AER 2016 for CO₂; Myllyvirta 2014 for the rest.

The cost to people, as calculated by Mike Holland [2017], would include 626 ‘equivalent’ deaths each year from lung cancer, heart disease, lung disease and strokes. This side of death, there would be some 3 500 cases of bronchitis, over a million ‘restricted activity days’ with some 26 000 children suffering asthma attacks, and nearly 280 000 lost working days. The economic costs would add up to around R9.2 billion.⁷⁸ This does not include the costs of emissions from the mine: the dense clouds of dust and the smoke from discard dumps burning at ground level.

Eskom has not installed sulphur scrubbers on any of its existing power stations and, in 2007, it planned to build Medupi without flue gas desulphurisation (FGD) scrubbers whereas Kusile was planned with FGD. Then CEO Jacob Maroga said that Medupi would be cheaper than Kusile because of “the lower air quality safeguards necessary at Medupi, given the relative lack of pollution in Limpopo” compared with Witbank.⁷⁹ The comment echoed the notorious internal memo circulated by World Bank chief economist Lawrence Summers, in which he argued that poor countries were under-polluted and

⁷⁸ \$664 million converted at R14/\$.

⁷⁹ Engineering News, July 27, 2007.



“the economic logic behind dumping a load of toxic waste in the lowest-wage country is impeccable ...”⁸⁰

The Air Quality Act (AQA) of 2005 said that ambient and emissions standards must be developed. In the meantime, it introduced interim ambient standards aligned with World Health Organisation (WHO) guidelines to protect people’s health, as had been demanded by civil society organisations. They were already periodically exceeded in Marapong and Onverwacht, as the DEA found in its Record of Decision (RoD) on the Medupi EIA, and Eskom’s Matimba power station was the main source of emissions. The DEA also found that the health of people in Marapong would be affected although the heaviest pollution, carried by the prevailing winds, would fall across the game farms south-west of the plant. It nevertheless issued an environmental authorisation but stipulated that Eskom should establish an environmental monitoring programme and that it would be required to meet ambient air quality standards and minimum emissions standards when they were promulgated.

The DEA issued the final national ambient standards in 2009. They had been fought over by government, industry and civil society in the standard-setting process that followed from the AQA. Civil society lost and the DEA’s new standards were significantly less stringent than the interim standards. The World Bank then brushed away the Inspection Panel’s finding that community concerns about high health risks were credible. It claimed, with apparent satisfaction, that the new standards were not exceeded at Marapong and would not be exceeded even if Medupi was built without scrubbers. The standards would be exceeded only in the area with a “sparse population on the game farms” downwind of the plants [2012: 18]. Nevertheless, the Bank had insisted that Eskom install FGD but only at the first maintenance shutdown for each unit – six years after start up. It also argued that this would in any case have been required to meet the standards as stipulated in the DEA’s RoD and that this was another indication of a robust ‘country system’.

80 See <http://www.ejolt.org/2013/02/lawrence-summers%E2%80%99-principle/> for a discussion of the Summers Principle.



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That meant Eskom got six years' grace while the communities would get six years pollution. However sparsely populated, people in the 'maximum impact' zone will still be affected along with animals and plants. Moreover, the wind is inconstant and local people at all points of the compass say that they get a strong smell of sulphur when the wind comes their way. In Marapong, people say they are most likely to smell it when there is no wind. Periodically, they can see down-drafting from the Matimba stacks.

In defence of the faith it had put in the South African 'country system', the Bank also noted that the Waterberg had been declared a Priority Area under the AQA. This would allow the DEA to "impose limits more stringent than national standards on existing and future emission sources if necessary to achieve compliance with ambient standards" [2012: 19]. To the contrary, however, emission standards have been relaxed as described below.

The fight for minimum emission standards (MES) goes back to the Consultative National Environmental Policy Process (Connep) of the mid-1990s. Civil society demanded emission standards in order to make it possible to hold industry to account for excessive pollution. Industry didn't want them at all. As groundWork director Bobby Peek observes, "Their inclusion in the AQA was a victory for fenceline groups against concerted industry opposition" [2014: 24]. They were then the subject of intense negotiations over the next seven years, with regulations promulgated in 2010 and amended in 2013. They required compliance with 'existing plant' standards by April 2015 and with stricter 'new plant' standards by April 2020.

Eskom was absent from the last stakeholder meeting discussing the 2013 amendments but gave notice a few weeks later that it would seek exemptions from, or rolling postponements of, compliance with the 2015 standards. In January 2014, it submitted its request to the DEA and published over 80 documents for public comment with the comment period limited to 37 days. Peek comments, "It is difficult to avoid the conclusion that Eskom planned this all along. Through seven years of negotiating emissions standards, it did nothing to adapt its plants to comply once the standards were implemented" [24].



Eskom said it could not comply because the abatement equipment, particularly FGD, was too expensive and used too much water along with other environmental impacts. It even claimed that “power station emissions do not harm human health – a statement which it subsequently withdrew – but did not conduct any health assessments to substantiate this assertion” as CER attorney Robyn Hugo records [2014: 57].

The DEA duly complied with Eskom’s request for postponements in February 2015, two months ahead of the April deadline for compliance, and the air emission licence (AEL) for each Eskom plant was then amended by the local authority.⁸¹ However, industrial chemist Eugene Cairncross shows that seven of 12 coal plants granted postponements for ‘existing plant’ standards have likely not complied even with the relaxed requirements of the new AELs [2017].

For Medupi and Matimba, Eskom requested postponements of the SO₂ limits for both the 2015 standard and the 2020 standard. The 2015 standard is already very relaxed, however, allowing a daily average concentration in the exhaust air of 3 500 milligrams per cubic metre (mg/Nm³), and the DEA refused the request. The 2020 standard is somewhat tougher, allowing 500 mg/Nm³ – still weak by international standards – and the DEA said the two plants could postpone compliance to 2025.

In January 2017, however, Eskom again applied for postponement of the 2015 standard, asking that it be retrospectively relaxed to 4 000 mg/Nm³. CER objected that this could not be legally permissible. The application amounted to an admission “that it has knowingly been in breach of the AQA ... for nearly 2 years” nor had it done anything to bring the plants into compliance. Medupi was to have FGD retrofits, which would not be completed before 2026, at least a year later than the postponement granted for the 2020 standard. But Eskom had no plan to reduce emissions from Matimba. Rather, it had said it would “seek ‘rolling postponements’ until [non-compliant] stations are decommissioned”. This amounted to “seeking an exemption from MES which ...

81 Emission standards are implemented through the AELs which are issued by district municipalities. Municipalities must uphold national standards and may tighten up on them if local conditions warrant it. None of them have the capacity to seriously monitor Eskom plants.



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is not legally permitted".⁸² Matimba is scheduled to complete decommissioning only in 2041.

Interested parties were given a month to comment on Eskom's application. The DEA issued its decision in September 2018 – 19 months later. It allows Eskom a monthly average, rather than a daily average, SO₂ concentration in the exhaust air of 3 500 mg/Nm³. The longer averaging period gives Eskom a lot more latitude as managers can balance out exceedances over that time. There is no indication that Eskom will in any way be penalised for having exceeded its limit since 2015.

In October, the DEA issued amendments to the MES regulations. It clarifies that there will be no rolling postponements: it allows no further postponements of the 2015 standards and only a once-off postponement of the 2020 standards for the period 2020 to 2025. However, a plant that will be decommissioned by 2030 can apply for a suspension of the 2020 standards, provided that it supplies a detailed decommissioning schedule and complies with the 2015 standards. The amendments also sneaked in a doubly relaxed 2020 SO₂ standard for Eskom, raising it from 500 to 1 000 mg/Nm³. This rather confirms that compliance can be enforced by changing the rules, not the pollution. There has been no consultation on this amendment and it will be contested.

These amendments do draw a line under Eskom's easy abuse of postponements, but it also allows another 12 years of heavy pollution from the older plants, and five years from the newer plants. It poses a particular problem for Matimba, which is not complying with the relaxed 2015 standard and not due to complete decommissioning until 2041. Medupi will comply with the 2020 standard once it has retrofitted FGD on each unit and it must now complete that work by 2025.

82 CER on behalf of the Life After Coal campaign, *Submissions on the background information document for Eskom's postponement application in respect of the 2015 minimum emission standards (MES) timeframes for Eskom's Medupi and Matimba power stations*, 24 February 2017.



Ruining the river

As with air quality, the Bank takes a conveniently sanguine view of South Africa's 'country system' for water. Responding to the Inspection Panel, the Bank's management emphasises that "water resources planning in South Africa ensures that all priority requirements, 'Reserves' in particular, are taken into account. The concept of the water reserve is central to water resource management ... and establishes priority use according to the National Water Act" [2012: 20].

On paper maybe, but not in reality. The determination of an ecological reserve for the Mokolo has not yet been undertaken and it is not taken into account in water allocation. In 2004, before there was any plan to build Medupi, the DWS estimated⁸³ that 17 Mm³ per year would be required for the ecological reserve in the Mokolo, and warned that "implementation of the ecological reserve could cause serious imbalances" [2004: 55] since water in the Mokolo is fully allocated – and indeed subject to fierce competition.

The regulatory approach for the World Bank loan to Eskom was part of an experiment to rely on 'the country system'. In other words, unlike the regulatory systems in many third world countries where the World Bank lent money for mega projects, South Africa's own regulatory system was judged to be up to the task of managing the environmental and social impacts of 'the Project'. This easy assumption was not only wrong, but left a regulatory vacuum around the Medupi project.

In the years between 2012 and 2019, the DWS showed a sharp decline in ability and political will to regulate water use and protect the water resources of South Africa. For example, in 2008 the DWS recognised that a large number – up to two thirds – of South Africa's municipal wastewater works were dysfunctional [Ntombela et al, 2016, DWA 2009]. Untreated and half-treated sewage streamed into the country's rivers from the majority of South African municipal sewage works, or burst out of broken pumps in residential areas, as it clearly does in Lephalale.

83 DWAf, 2004. "Internal Strategic Perspective, Limpopo Water Management Area"



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The department instituted a programme – the Green Drop incentive scheme – to deal with the situation. During the reign of water minister Nomvula Mokonyane, a staunch Zuma supporter, the Green Drop reporting system was sabotaged from the top. The situation worsened to the point that, in 2018, a Human Rights Commission hearing was instituted into the problem of raw sewage flowing into the Vaal River. In November 2018, engineers from the South African National Defence Force were deployed in the Vaal area to rehabilitate neglected sewage works.

But these were not the only issues afflicting the department. A year earlier, in November 2017 the South African Water Caucus, a civil society network of water activist organisations, published a report⁸⁴ in which the DWS was described as dysfunctional and paralysed. Specific issues raised in the report included:

- Failure to make public the results of Blue Drop (water quality) and Green Drop (waste water treatment) inspections since 2013, thus depriving the public of information on whether water and wastewater treatment plants are functioning and complying with water quality standards. Behind the secret reports, there was an ongoing deterioration in wastewater treatment works and infrastructure due to lack of maintenance and investment. A large number of municipal sewage works posed serious risks of completely untreated sewage entering rivers, streams and dams. This has dire impacts on water quality and human health, including enhancing the spread of diseases such as hepatitis A and diarrhoea;
- DWS had considerable human resource and organisational challenges, including the suspension of senior managers, high staff turnover and vacancy rates and intensified capacity constraints;
- DWS had serious financial mismanagement related to over-expenditure, accruals and failure to pay contractors and corresponding escalation of debt, overdraft of the Water Trading Entity and debt owed to the

84 http://emg.org.za/images/downloads/water_cl_ch/SAWC_State-of-DWS-Report.pdf



Reserve Bank, irregular, fruitless and wasteful expenditure, poor revenue collection and corruption allegations;

- DWS under Mokonyane created considerable policy and legislative uncertainty, through the publication of the proposed Water Master Plan, proposed Water and Sanitation Bill and the proposed National Water Resources and Services and Sanitation Strategy, as well as highly worrying steps to undermine or destroy established water institutions, including plans to consolidate nine catchment management agencies into a single national agency and plans to discontinue key statutory bodies like the Water Tribunal and Water Boards. These plans are now withdrawn or left in limbo;
- The report specifically pointed to “significant deficiencies in compliance monitoring and enforcement. Notably, DWS only has 35 compliance and enforcement officials for the whole country... The 2016/17 National Environmental Compliance and Enforcement report highlights that DWS has completely failed to undertake meaningful enforcement action against offenders. Of 321 facilities inspected, 76 were found to require enforcement action, but DWS has had zero (0) convictions for criminal offences. Despite widespread non-compliance, DWS has only suspended one water use licence since 1 January 2008.”

In May 2018, the South African parliament set the terms of reference for an official enquiry into problems in the department.⁸⁵ The scope of the enquiry indicates the range of problems, including “financial aspects, human resource management, infrastructure projects, implementing agents, Ministerial directives, investigations and governance of the water boards... fruitless and wasteful expenditure... financial deviations... the root causes for the high turnover of Directors General (DGs)...” The inquiry started in November 2018.

The World Bank also put their trust in an equally, if not more, dysfunctional department, with little regard for the environment or people living in it, namely the Department of Mineral Resources (DMR). The CER report “Zero Hour” (discussed more fully in groundWork Report 2016) showed that both

85 Parliamentary Monitoring Group, see <https://pmg.org.za/committee-meeting/26300/>



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the DMR and DWS have failed to regulate mining, have failed to protect people and their environments against mining impacts in the Mpumalanga Highveld, and that this constituted a violation of the human rights of people in the area [CER 2016]. The removal of millions of tons of sand from the Mokolo River to build Medupi, took place in this regulatory vacuum, clearly showing how the World Bank's faith in South Africa's regulatory systems was misplaced.

Sand mining in Mokolo River

People from the small settlement of Ellisras had previously mined sand from the sand river bed for building purposes. But the scale of sand mining reached a completely new level with the building of Medupi. Up to 488 000 m³ of sand would be required to mix the final 800 000 m³ of concrete used in Medupi,⁸⁶ and it is possible that all of it came from the lower Mokolo, close to Lephalale. Aerial photographs included in the 2006 DEA 'State of the River' report on the Mokolo shows the removal of sand on vast scale. The report also ascribed the "infestation" of the sand river bed by reeds to the "influence of flow regulation and the absence of normal flooding due to the Mokolo Dam" [2006: 17].

The South Africa 'country system' was of little use to irrigation farmers who complained to the Departments of Environment Affairs, and Department of Water Affairs. Dissatisfied with the South African regulatory response, the concerned people included the Mokolo sand mining issue in the complaint made to the World Bank Inspection Panel in 2011. They argued that not enough attention had been paid to the cumulative impacts and that the 'country system' approach had failed.

The Inspection Panel found that the "allegations of harm" – that groundwater availability would be affected by sand-mining in the Mokolo for the construction of Medupi – "were credible" and "may affect the Requesters' rights or interests as residents in the impact area of the plant, and thus are potentially of a serious character". The panel also noted "that these impacts of

86 Own calculation based on amounts given at http://www.eskom.co.za/Whatweredoing/NewBuild/MedupiPowerStation/Pages/Medupi_Power_Station_Project.aspx and concrete/cement calculator at <http://www.afrisam.co.za/calculator>



the Project on water resources and ecosystems are cumulative in nature". The Panel found the same in terms of other water-related concerns, namely the "impacts on surface water availability as a result of water supply to Medupi, on water quality as a result of Medupi's water use and waste water disposal, on water quality and availability as a result of expanded mine operations to supply coal to Medupi" [World Bank 2011: 81]. The overall finding was, "In sum, the current situation is that Medupi is being constructed when the full spectrum of likely impacts on water resources has not been reliably identified or assessed" [83]. It also found:

The focus of [the World Bank] Management in relation to water resources appears to have been on ensuring that the Medupi power plant had a reliable source of water supply, and that insufficient attention was given in Project documents to the potential impacts that the use of water by the plant might have on other users and to the evaluation of the potential significance of Project impacts on quantity and quality of surface and groundwater resources. The evaluation of the potential significance of impacts on water quality, on maintenance of 'the reserve', on the affected freshwater systems and the services they provide, and on non-strategic and downstream water users (some of whom may be particularly vulnerable) is, in the view of the Panel, inadequate [81].

However, the subsequent 'management response' takes the position that, "Management strongly believes, based on extensive due diligence and experience to date, that the necessary capacity and systems are in place to deal with any issues that may arise during construction as demonstrated in the Project so far, and during operations" [World Bank 2012: 5]. Management then claims that "the panel found no actual direct harm resulting from the project", making a mockery of the inspection panel and the complaints brought before it.

Piet and Susan Goosen, who have lived on a farm with irrigation rights and 2 km frontage on the Mokolo River since 1976, were directly affected by the



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impacts of the sand mining on the river.⁸⁷ They were aware of sand mining for Matimba in the 1980s but say it was not on the same scale as for Medupi. Almost overnight, large quantities of sand were taken from the river immediately downstream and the sand from their stretch of the river then washed into the emptied mine pit. Since construction started at Medupi, the level of the sand bed has dropped by 3 m or more and soil and trees from the river banks are toppling into the river. It has become much more difficult to draw water from the sand bed aquifer. The sand bed is also eroded downstream of the diggings. Just outside Lephalale town, the main bridge over the Mokolo River bears mute witness to the large-scale removal of sand from the river. Its foundations are exposed right down to the concrete filled drums that anchor the pillars of the bridge. With construction at Medupi nearing completion, the bulk of the sand mining has been done. But the Goosens do not think that the damage stops there. They suspect that the sand miners have mined through the clay layers, destroying the sand bed's capacity to store water.⁸⁸

The response from South African officials – from the departments of water, of environment and of mineral resources – clearly protected the sand miners rather than the river. A multi-departmental task team investigated the issue but it seems that the only outcome was to give the illegal sand miners an opportunity to legalise their activities. According to Francois van den Berg, chairperson of the Mokolo Irrigation Board, “when the sand miners get caught, they pay a R1 million fine, get a retroactive licence, and then continue to take sand worth R60 or R70 million out of the river”.⁸⁹ He argues that the long term effects of the sand mining on the river cannot be predicted. Nobody has investigated the role of the clay layers in water storage. In a meeting with Eskom executives, he asked why they were taking stolen sand from the river. “They did not have an answer for me”.

The sand mining continues, although not within the bounds of the new permits, according to the Goosens. Social tension also continues between irrigation

87 Interview April 2018

88 The clay lenses found in the sand aquifer allow local perched water tables to hold water closer to the surface of the sand.

89 Interview 13 April 2018



farmers and those local businesspeople who have grown spectacularly rich on the sand mining. According to the Goosens, the sand miners admit nothing wrong in their actions. “They even claim that through their sand mining they are rejuvenating the river, because they remove the reeds that are growing in the sandbed.” And the big companies – particularly Afrimat, who bought the sand from the illegal sand miners – have turned their aggression on the Goosens, threatening to take legal action against them if they don’t stop complaining about the sand mining. Yet, says Van den Berg, farmers are subject to very strict rules about how they pump water out of the river. If they make a hole in the riverbed, they have to put the sand back into the river downstream of the hole they have made. The next flood will then even out the sand again. But regulation is not applied fairly, because law enforcement officials in both DMR and DWS “just don’t have the balls to do that”.

Van der Berg is sceptical about the effectiveness of officials. In one case, in 2012, he saw how an application for a Water Use Licence was refused by a regional DWS manager in Polokwane, only to be approved by the acting Director-General in Pretoria. He is also sceptical about how consultants do environmental studies and impact assessments: “They write reports in such a way that they will be approved. There are hundreds of these environmental studies but I have never seen one not approved ...”

In 2010, the then minister of environmental affairs, Buyelwa Sonjica, explained in parliament that the sand mining had to happen, because Medupi was “a national strategic project for socioeconomic development”.⁹⁰

Boom town Lephalale

The decision to build Medupi in Lephalale was taken by Eskom and national government in 2006. Construction started the next year and triggered explosive growth in the population particularly around Lephalale town but also in Ga Seleka. The population of the wider municipal area also increased dramatically from 85 000 in the 2001 census to 115 000 in the 2011 census. At the same time, despite or because of the construction boom, unemployment

⁹⁰ Siphso Kings, Mining puts river in deep trouble, Mail and Guardian, 11 January 2013.



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rose from 18% to 22%, according to StatsSA.⁹¹ The Lephalale municipality's 2018 Integrated Development Plan (IDP) now puts the population at 140 000. Local people think it likely that many are not counted and the numbers are in fact much higher. The population of Lephalale town has more than doubled on the estimate of Jacques Snyman, coordinator of the Lephalale Development Forum (LDF), from about 20 000 to over 45 000, of whom 30 000 live in Marapong.⁹²

Most of the people coming into the town were men. The IDP gives a breakdown of the population figures. It shows more or less equal numbers of boys and girls under 15 and of men and women in their 60s. But there is a dramatic difference in the numbers of men and women between the ages of 15 and 60. Of the total of 92 000, 55 000 are men and 38 000 are women. The difference is 17 000 and may be higher since it is the men who are most likely to be undercounted because some are there for short periods while others, according to Phadi and Pearson, are “undocumented job seekers” [2018: 8].

Jobs

While Eskom says employment peaked at 18 000 at Medupi, others think it is more. Snyman points out that Exxaro was constructing the Grootegeluk expansion at the same time. He estimates that construction employment peaked at between 25 000 and 26 000 people, with an extra 4 000 at Grootegeluk and up to 21 000 at Medupi. Local NUM officials give a slightly lower total of 23 000 at the peak with 20 000 at Medupi.⁹³ Many are housed at the construction camp outside Marapong, others found their own accommodation in Marapong or have built shacks and some have brought their families in. Thousands of general workers are bussed from Ga Seleka 90 km away in daily bus convoys – making for an 800% increase in business for Lowveld Bus Services. Managers, supervisors and skilled workers are housed in Onverwacht.

91 http://www.statssa.gov.za/?page_id=993&id=lephalale-municipality. This is contradicted by some local people who say unemployment was extremely high in 2007.

92 StatsSA 2011 puts Lephalale at 44 000, with 26 000 in Marapong and 18 000 in town.

93 David Radibotseng and Oscar Mnisi, National Union of Mineworkers, interviewed 18 April 2018.



The Grootegeluk construction was completed in 2013. The expanded mine now employs 3 200 people, according to Exxaro’s website, although the DMR says it employs 1 720.⁹⁴ The mine construction workers have already departed. Increasing numbers of Medupi construction workers are now also being ‘demobbed’ – an expression taken from the demobilisation of soldiers after a war – as the construction is completed. By May 2018, there were 13 500 left with another 7 000 due to be demobbed by the end of the year.⁹⁵ Medupi is a highly automated plant and, when complete, will employ less than 600 people. This adds to the 950 people employed at Matimba. Hence, the mine and power stations together will employ a total of about 4 500 people. In addition, up to 2 000 workers are brought in for regular maintenance shut downs at Matimba [Hermanus 2010b: 20].

Municipal mismatch

Lephalale municipality had no part in the decision to build Medupi – heralded as a strategic national project. Nor it seems, did it get much support from national government. Medupi was dumped on it and it was left to sink or swim. Mostly, it sank. “We as councillors are the side show for things that we are not even aware of. I think I am made a clown,” says Councillor Astrid Basson.⁹⁶

Lephalale’s revenues increased considerably, from about R84 million in 2007 to nearly half a billion in 2018, but this has not made it more stable. It has kept itself in the black and, as councillors Malosi Marakalala and Steve Manamela note, the Auditor General gave it an unqualified audit, albeit with findings, for 2015/16. However, it has no cash reserves and barely enough to cover its immediate costs including salaries. This makes it very vulnerable to any reduction in revenue or even late payments, according to Treasury. It has also performed badly on fruitless and wasteful expenditure.⁹⁷

94 Ministry of Mineral Resources, Written reply to National Assembly question (no. 2710), 7 September 2018.

95 Elana Greyling, *Eskom’s Medupi coal-power plant nears completion*, The Citizen, 23 June 2018; Rudzani Tshivhase, *Eskom forecasts major job losses*, SABC, 30 May 2018.

96 Astrid Basson, interview 10 April 2018.

97 Municipalmoney.gov.za



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Lephalale's capacity did not keep up with the increase in revenue. If anything, it has lost skills. According to senior officials, it cannot pay the salaries needed to attract skilled people and the work environment is "over-regulated, while the political atmosphere can be stifling" [Phadi & Pearson 2018: 33]. Former town planner Dries de Ridder observes that there is a very high turnover of senior officials, including "six or seven municipal managers in 15 years". There is no continuity. Department heads are hired and fired for their local political connections. They come in on five year contracts rather than as permanent staff and many do not make it to the end of their term as they are taken out with the political swings. He argues that salaries are in fact inflated but officials do not have the qualifications to match. That may be disputed but it is common cause that, down the municipal pecking order, there are not enough workers with the right skills to maintain basic infrastructure.

When the boom hit town, the municipality was flooded with planning applications, land was illegally occupied and contractors' camps and other developments "sprang up across the town". Old pipes and wires were overloaded and "started bursting" and sewage spillages "became routine". And the roads started crumbling under the heavy trucks bringing in construction materials [Phadi & Pearson 2018: 8].

More broadly, there is a sense of things being out of control and loaded with contradiction. Amongst other things, we heard that the real decisions shaping Lephalale are being made elsewhere, that mega project construction companies and prospective mining corporations come with a lot of money and promises, that there is a good working relationship between the main political parties (ANC and DA), that deals are done under the table, that information is manipulated and the municipality does not have the means to assess it, that white officials who know the system have misled newly elected black councillors, that business people with ANC connections have an advantage, that there is a common concern for the welfare of the people, that procurement is rigged at inflated prices, that electoral wards have been gerrymandered, and that leading councillors are primarily concerned with status, factional politics and control of patronage.



In many ways this sounds like the familiar contradictory story of neoliberal South Africa overlaid on the political transition. But it is pressure cooked by the mega project that has defined the town for over a decade. Phadi and Pearson [2018] tell a story of a town that has inherited its infrastructure from the giant corporations, which also built most of the town, struggling to assert its autonomy. But where it has asserted control, things have crumbled in its hands.

Eskom and Exxaro point to major public infrastructure investments as benefits of the boom. Among other things, they upgraded and widened Nelson Mandela Drive from Onverwacht to Medupi. That was essential to the construction project. At a greater distance, they contributed to paving the main road through the villages from Ga Seleka to Shongwane. These and other projects are intended to align with the municipality's IDP. They are coordinated through the Lephalele Development Forum (LDF) but contracted and paid for directly by the corporations. The mayor and leading councillors are not happy about the role of the LDF, says Basson. They want the money to flow through the municipality.⁹⁸

The municipality gets its bulk water supply from Exxaro's Zeeland water treatment works but makes little profit from selling it to residents. It therefore wants to take control of the supply and reckons it will get R30 million in revenues from bulk sales to mines and industry. In 2010, it did a deal to buy the plant from Exxaro with a loan from Exxaro. The debt is to be paid over 15 years and is costing about R14 million a year. But the municipality does not have the skills to operate it and does not seem to be doing anything to acquire them. As Phadi and Pearson note, it is not maintaining the town water infrastructure that it does control. Hence, city officials ask if they will have to give Zeeland to someone else to operate "at a premium" when they have finished paying for it [2018: 28]. In that case, the municipality will not get the anticipated revenue. Moreover, Exxaro says it is not making a profit from what it sells to the municipality. If that is so, future revenues may be available only at the cost of not spending enough to maintain the plant.

98 Astrid Basson interview, 10 April 2018.



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Meanwhile, the sewage works is crumbling, along with the pipes and pump stations. It was originally built and operated by Eskom and handed over to the interim municipal council in the mid-1990s. However, the municipality did not maintain it. In 2010, the municipality prevailed on Eskom to upgrade the town sewage works to cope with the expanded demand from construction workers. The expanded plant's capacity is 10 million litres a day against demand of 7 million litres. It is still not maintained and sewage is spilling into the Mokolo.⁹⁹ The municipality has rejected an offer from Exxaro to operate the plant but nevertheless negotiated with Waterberg Coal (aka Sekoko) to operate it in return for supplying treated water to its proposed mine.¹⁰⁰ This agreement presumably fell through when Waterberg Coal fell on hard times [see Chapter 4]. Temo is now proposing to build a pipeline from the treatment works to supply its proposed mine near the Botswana border, 60 km west of Lephalale. It is not clear if it too has offered to operate the sewage works. The municipality has, however, done a deal with Resgen subsidiary Ledjadja to upgrade the Marapong sewage works. Resgen aims to develop the Boikarabelo mine just west of the Temo mine. It is not clear exactly what deal was signed, but they were negotiating a "30 year built, maintain and transfer contract" (sic) according to Lephalale's 2018 IDP [85]. These deals appear merely to substitute dependency on Exxaro and Eskom with dependency on smaller 'boom 3' mining corporations with uncertain prospects, as we will discuss in Chapter 4. But perhaps the real game here is not to escape patronage but to create new sources of patronage.

The municipality also wants to take control of electricity distribution to Marapong. At present, the municipality supplies Onverwacht and old Ellisras and this is a major source of revenue. It has recently negotiated an expanded bulk supply from Eskom, according to the 2018 IDP. The capacity of the new substation is four times current demand for the whole of Lephalale – which includes Marapong – presumably to cater for continuing rapid growth. Down the wire, however, the municipality's "poor management of electrical

99 Jacques Snyman interview, 9 April 2018; Dries De Ridder interview, 19 April 2018; Leoni Kruger interview, 13 April 2018.

100 Waterberg Coal Company Statement: *Paarl Waste Water Treatment Plant Agreement*, 3 August 2015.



networks” has resulted in a deteriorating infrastructure and major electricity losses according to the Auditor General [quoted in Phadi and Pearson 2018: 25].

Eskom supplies all other areas of the municipality including Marapong. Municipal officials want to take over distribution to Marapong both to expand electricity revenues and to force payment for water. As Charles Lekaka, the Chief Financial Officer, told Phadi and Pearson, “People are consuming water, but if they do not pay I cannot switch off electricity because Eskom [provides it directly]. So my debts keep on rising in Marapong” [24]. This strategy will certainly provoke conflict with the people of Marapong but seems unlikely to do much for the municipality’s revenues.

Already, people in Marapong are unhappy with the state of their water supply. It may be billed by the municipality but the physical supply is an extension of the supply to Matimba and is controlled by Eskom. The power station’s water requirement takes precedence over Marapong and the township is regularly cut off. Local people say most areas suffer ‘water load shedding’ daily for between one and three hours. Some areas, however, only get water at night and, in September, one area had been without water for over a week. Moreover, whereas the supply to Matimba is “super clean”, Marapong’s water is no longer so clean. This suggests that the infrastructure within the township is deteriorating. Meanwhile, Marapong’s shack settlements are supplied from water tanks erected by the municipality.

Property and the city

People with property did best out of the Medupi boom. “Those of us without, just had to watch,” says Marapong businessman Sihle Baloi. This was also true for transport. “Lots of people made money but Louis Rossel had already been there.”

Rossel’s Lowveld Bus Service, established during boom 1, expanded more than 800% with boom 2 and now runs a fleet of 300 buses, according to a



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promotional video.¹⁰¹ The company has a virtual monopoly on transport of workers for the major construction corporations at Medupi and benefits from the 90 km daily commute (each way) of thousands of workers from Ga Seleka and Shongwane. It thus remains the beneficiary of the spatial absurdities inherited from the apartheid regime.

Property has seen an extraordinary boom. Rents are more than double Johannesburg rents and equal to some of the richest enclaves in the country. Local people could not afford this unless they were part of the boom – employed by a company that owned property or rented accommodation for them. Middle managers on reasonable salaries at the municipality have been priced out of the market and are living in the shack settlements. Meanwhile, accommodation of all sorts sprang up all over the town. Apart from the stress on Lephalale’s aging pipes and wires, this created a crisis in town planning. Famously, at the start of the boom in 2007, Exxaro arrived one morning at the municipal offices with 1 000 planning applications for houses and associated infrastructure. The company then seconded town planners to the municipality, effectively to approve its own plans. The major construction companies followed suit.

Well placed property owners quickly turned farms into township developments. Many did not wait for rezoning or planning approvals and buildings went up illegally. Others did get approval, but this has given rise to allegations of favouritism and bribery. Between Onverwacht and old Ellisras, the developments are in strips, following the shape of the narrow farms with frontage on the river. Legal or illegal, many of the buildings were thrown up in a hurry and are already cracking up – just in time for the bust. Hotels in town expanded, and started charging exorbitant room rates, while tourist lodges on the edge of town converted to construction camps. Builders, plumbers and electricians, good and bad, thrived. Big and small shopping malls proliferated. The Lephalale Mall in Onverwacht opened in 2012 and completed a phase 2 expansion in 2014. It has four anchor tenants – Checkers, Pick n Pay, Woolworths and Game – and houses 80 other retailers and all the major banks.

101 <https://www.youtube.com/watch?v=HtpbjFpwBrI>



In Marapong, Baloi completed an 18 room guest house in 2014 and secured a contract with Eskom guaranteeing income on ten rooms. He notes that he was late on the scene. “The guys in the round before us did very well.” Nevertheless, he had full occupancy through to 2017. Most of ‘the guys before us’ were in Onverwacht or Ellisras. Baloi says that some of Eskom’s people did not want to stay in the township, but that his business has shifted the way Marapong is perceived.

In the context of this boom, Lephalale started to advertise itself as the ‘first democratic city’ and an ‘energy hub of Africa’ with more mines and power stations across the Steenbokpan and into Botswana to follow Grootegeluk, Matimba and Medupi. Councillors saw the first challenge being to integrate the city. Imagining the continued rapid growth of the population, they saw the opportunity to expand westward beyond Onverwacht on the farm Altoostyd, which was bought for the purpose by the provincial department of Cooperative Governance, Human Settlements and Traditional Affairs (CoGHSTA). This area would then be linked by road to Marapong which, at present, has only one entrance on the opposite side facing Grootegeluk colliery. Some roads and plots have been mapped onto the ground at Altoostyd. The vision is that it will provide a mix of housing – for high, middle and low income groups – but, at present, there is a single construction camp in the middle of the area.

Municipal officials complain that developing the city has stalled because the municipality does not own land. Development therefore depends on private land owners who may not share the municipality’s vision or who do not have the capital to do it. Even at Altoostyd, “the municipality is limited in its capacity to fast-track the process and emerges merely as a junior partner to CoGHSTA” [Phadi and Pearson 2018: 20]. CoGHSTA, however, is not a good partner. It has already built RDP houses in the villages of Ga Seleka and done it badly. The municipality, on the other hand, has no budget for housing and, according to officials, no “authority to make decisions on human settlements” [20]. It has nevertheless tried to persuade people living in shack settlements to move to Altoostyd. In Leseding, people say that the mayor is trying to coerce them into moving but has nothing to offer them in Altoostyd other than another shack settlement – probably with less space than they have at present and no better



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prospects of work. Nor does it seem likely that this would create the basis for a mixed housing settlement.

But the real problem with Altoostyd and the ‘vibrant city’ is that it is founded on a mirage, produced by the coal industry and national government, of the Waterberg as the next coal frontier. That mirage is already dissolving as we will discuss in Chapter 4. In the meantime, it has the municipality chasing more or less expensive figments of the imagination while everything else stalls.

The idea of the city relies on the continuing rapid growth of the population. A Lephale CBD Development Plan from 2013 showed the town’s population growing from 43 866 in 2011 to 77 930 in 2020 to 129 595 in 2030. But rather than having ever more people to fill in the spaces between old Ellisras, Onverwacht and Marapong, the population of Lephale town is already declining as the Medupi boom turns to bust.

The collapse of the property market is just beginning. Local people say that increasing numbers of the new houses and flats in Onverwacht and old Ellisras are standing empty. The rents, however, have yet to come down as owners try to pay off their bonds. The same thing is happening to people who mortgaged their homes to turn them into vast, double storey bed & breakfast mansions. They now have echoing halls and empty rooms. Those who have not paid off the bond will have little prospect of doing so. And even if they repossess, the banks will not find buyers except at fire sale prices. At the Lephale Mall, the FNB branch is closing – although it still has a branch elsewhere in town – and more tenants are likely to follow. A block away, OK Bazaars has closed shop at the small Marula Mall where it was the anchor tenant. Not surprisingly, the mall is rumoured to be facing bankruptcy. It may be expected that the remaining malls will shortly be competing for tenants.

In Marapong, occupancy at Baloi’s guest house dropped from 18 to 11 from January 2018. But he still has an ambitious three storey building under construction. It will have parking, a spa and gym and long and short stay accommodation. He has put construction on hold because his construction company is busy with a contracted project and he is building with cash, not debt. Avoiding debt is central to his business strategy and he reckons it will



see him through the end of the Medupi boom. Like many others in Lephalale, he is banking on the next boom and, having missed the start of this one, he wants to be ready for it.

Inside Medupi

Medupi has had 40 major contractors on site and many more sub-contractors. The big foreign contracts are with Alstom of France for the turbines and Hitachi Africa for the boilers to be built by Hitachi Europe in Germany. These contracts are for both Medupi and Kusile. Reddy et al [2013] note that this 'fleet' option was said to reduce costs compared with issuing separate tenders for each plant – suggesting that turbines and boilers come cheaper by the dozen. In 2010, when Kusile looked unaffordable and Treasury had to double up on its guarantees, the fleet deal would have raised the cost of cancelling Kusile. Effectively it meant that, instead of two lumpy mega projects, Medupi-Kusile became a double mega project. In so far as they were trapped by the fleet deal, Eskom (and Treasury) were then vulnerable to further escalations in borrowing costs. The doubling up also exposed the limitations of the South African skills base.

Other major foreign contracts went to US engineering corporates for project management: Parsons & Brinkerhoff (P&B) at Medupi and Black & Veatch at Kusile. The P&B contract was signed in 2006 and they were responsible for managing 38 major contracts at Medupi. The firm was then a subsidiary of US construction giant Balfour and Beatty. The latter was close to bankrupt in 2014, and P&B was then sold to Canadian transnational engineering consultants WSP. This is one of several takeovers of major Medupi contractors to have taken place in the 12 years since the first contract was signed. Most notably, Alstom has been sliced up into different parts which have either merged with or been taken over by other transnational engineering firms. In 2015, its power division was taken over by GE, the US transnational formerly known as General Electric. Subsequently, Alstom power was merged with ABB but left the heavy duty turbine business with GE. Alstom's rail business, meanwhile has merged with Siemens.



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The big local contracts are for civil engineering. All the big construction corporations were brought in on the Medupi and Kusile projects and allocated to one or the other: Murray & Roberts, Grinaker and Concor formed the Medupi Power Station Joint Venture (MPSJV); and Stefanutti Stocks, Basil Read, Group 5 and WBHO created a similar consortium at Kusile. This was justified on the grounds that the scale of the works was beyond the capacity of any single corporate. Subsequent to these deals, all the construction majors were paraded before the Competition Commission for collusive tendering. Amongst other things, they were found to have inflated the costs of the 2010 World Cup stadiums.

The Medupi construction site has not been a happy work place. Eskom initially took a freewheeling market approach, leaving project management and coordination to the major contractors. The Medupi Contractors put in place a project labour agreement (PLA) which was supposed to create uniform working conditions. There were dozens of contractors on site, however, and the PLA was not uniformly implemented. Corporates brought in their own skilled workers with whom they already had agreements in place and there was widespread use of labour brokers. Workers got different rates for similar jobs and the difference in conditions between skilled and general workers was stark. There were also six unions on site. They shared the view that the PLA was imposed on workers but did not have a coordinated response and, as National Union of Mineworkers (NUM) officials remark, do not share the same politics.¹⁰² Indeed, parallel with growing turmoil at Medupi, the Congress of South African Trade Unions (Cosatu) leadership contrived to expel the National Union of Metalworkers (Numsa) after it denounced President Zuma and refused to support the ANC's 2014 election campaign.

Numsa has the largest membership at the Medupi site. It observed that, from 2010, there were increasing numbers of wildcat strikes and sometimes violent demonstrations. By 2012, things were coming to a head. Living conditions were as much at issue as working conditions. The union compared conditions in the crowded construction camps with the worst of apartheid mine compounds

¹⁰² David Radibotseng and Oscar Mnisi, National Union of Mineworkers, interview 18 April 2018.



and said Murray & Roberts was feeding pig's food to workers. White workers, in contrast, were given houses or accommodated "in posh lodges and hotels".

In October 2012, Numsa addressed a memo to Eskom listing labour grievances against the Medupi Contractors, including oppressive management, racism and nepotism by white managers and militarised security. It cited the low wages of general workers – R16-R17 per hour or less than R3 000 a month – most of them from the Lephalale area. Workers from the villages spent hours on the buses on top of long working hours. There was also little training on offer and none for general workers who would therefore have no prospects for work after 'demobilisation'. Numsa attributed high levels of alcohol abuse to the conditions created by the Medupi Contractors and noted that this was tearing at the "social fabric of surrounding communities, bringing along social ills usually associated with mine sites".¹⁰³ It pulled out of the PLA and demanded that Eskom take charge of the site.

These conditions resulted in repeated strikes culminating in a ten week shut-down in February and March 2013. Workers torched some buses and construction equipment. In April, Eskom finally admitted that the PLA was not working and agreed to take a "more hands on" approach and negotiate a new agreement which would include a minimum wage, standardised pay, a travelling allowance for workers from the villages, and the appointment of a task team on training. Eskom also abolished the practice of rotating workers on three month contracts – to avoid labour rights – and stopped companies poaching staff from each other.¹⁰⁴

Following these events, in the view of several respondents the unions effectively took control of the site. They could demand the removal of managers who were then too scared to discipline workers. On a wild construction site, however, union officials felt their own authority was precarious. In 2015, as Tina Weavind reported, "a senior union official, who asked not to be named,

¹⁰³ Numsa statement: *Medupi workers working under hazardous and appalling conditions!* 17 April 2012; Numsa and alliance partners memorandum of demands to Eskom handed on the 19th of October 2012 in Lephalale.

¹⁰⁴ Terence Creamer, *Medupi labour deal to be overhauled as Eskom recommits to December start date*, *Engineering News*, 11 April 2013; *New labour deals agreed for Medupi, Kusile projects*, *Engineering News*, 12 June 2013; Interview Radibotseng and Mnisi.



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described the desperate tightrope leaders have been forced to walk when dealing with suspicious workers ... ‘Even your own people can kill you,’ he said ...”.

Demobilisation remained a flashpoint as workers still had no prospects beyond Medupi. Following the completion of Unit 6 in 2015, some 3 000 workers went on a wildcat strike in the belief that contractors had been paid completion bonuses. They demanded bonuses of R10 000 each. In response, Eskom shut down the whole site and the contractors fired 1 000 workers who, they said, were already on disciplinary warnings. Workers were out for eight weeks. Sacked workers resisted eviction from construction camps, took control of some camps and torched buses and buildings. Newly appointed Eskom CEO, Brian Molefe, accused them of treason. He was also reported to have accused Numsa of treason. For its part, Numsa denied that it was “losing control” of the workers. But union officials warned that this was the case and said workers jumped ship to other unions if their demands were not met. In particular, some workers crossed from Numsa to the Liberated Metalworkers’ Union (Limosa), the rival union created by Cosatu after expelling Numsa from the federation in 2013. Numsa officials said the violence was driven by workers who were drunk and high on nyaope and not by their members. But they could not be identified because they were wearing balaclavas.¹⁰⁵

NUM officials say that their members were not involved in the strike but were locked out and then caught up in the disciplinary actions. The union challenged dismissals of its members and won at arbitration. They also won the annulment of a ‘peace accord’ imposed on unions following these events but this has been appealed by the corporations. Numsa also challenged the dismissal of its members. Meanwhile, for the NUM, the site has returned to ‘normal’. There are standard procedures and terms for demobilisation – including a completion bonus of R1 500. The NUM is now occupied with monitoring that process.

105 Tina Weavind, *Inside Medupi’s labour pains*, Media24, 23 August 2015; Jan Gerber, *Eskom boss slams Medupi strike, calling it ‘treason’ and loadshedding a ‘national crisis’*, Media24, 12 June 2015; Sarah Evans, *Unions at odds over Medupi ‘strike’ and reinstatement offer*, Mail & Guardian, 15 April 2015; Sapa, *Eskom contractors fire over 1000 workers over Medupi illegal strike*, Timeslive, 27 March 2015; Gianluigi Guercia, *Numsa: Workers locked out of Medupi site*, Media24, 26 March 2015.



People working on site say that poor discipline is reflected in a routine neglect of safety but incidents are covered up to preserve appearances and bonuses. Waste management is neglected. Supposedly rigorous security remains porous and all kinds of material is said to be taken out through the main gate. In one case, the local managers of Bidvest subsidiary Renttech were caught at it and sacked. The company then left it to junior staff to run the equipment rental business for several months but gave them neither support nor recognition.

Underlying the ill-discipline on site is the ill-discipline of its management. The project was poorly planned and badly executed, according to instrumentation technician Cyril Landers. He contrasts Medupi with the construction of Sasol's Secunda plant where he was trained as an artisan. His career options were dictated by apartheid racial classification: black Africans were general labourers, coloureds were artisans, Indians were clerical workers and whites were managers. Nevertheless, the construction of Secunda was well planned. Theoretical training was given on site and in parallel with training-by-doing on the job to produce top class artisans. He subsequently worked on Matimba which was also well planned and the first unit was producing power within six years from the start of construction with less than half the number of workers at Medupi.

Local people were supposed to benefit from training at Medupi. For a local person employed as a general worker, there was no training at all. Those who were recruited in apprentice positions were sent into Lephalale for training but given unrelated work when they came on site. There was no structure for continued learning and most of them were demotivated and the quality of work was poor. And if workers wanted to drag the work out to hold their jobs for longer, it seemed that the big contractors did too. There was no sense of urgency, says Landers, and local managers for the transnationals were bringing their mates in, irrespective of qualification, on big salaries and inflated accommodation allowances.

The Medupi mega project thus created a feeding frenzy. Politicians feasted alongside the Medupi contractors. We were told that the ANC's fingerprints were all over the site. At senior level, Luthuli House interceded for managers



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who were neither competent nor interested in the work. At local level, politicians barged on site to demand that more local people be employed. The mayor in particular had captured recruitment to ensure that only those on his list got jobs. This ensured a reservoir of political support but also enabled him to mobilise a mob to any meeting so as to drown out dissent.

Local employment has been an issue of contention throughout the construction period. 'Local', however, may have the dimensions of Lephhalale, the province, the inland centres of power, or the country. Hostility has been directed at the employment of foreign workers justified on the grounds that local artisans do not have the skills, for example, for the high tech welding required for the high pressure boilers. This has become the standard media narrative, but it is disputed by local artisans who say there are plenty of welders capable of doing the work. The problem is that they come from Cape Town and Durban while unions and politicians based in Gauteng want to keep the jobs for their constituents. In this view, the skills shortage arises from the combination of politics, management's poor planning resulting in the failure to integrate training with the work on site, and the convenience of transnationals that can draw on foreign labour and keep them segregated on site and in their own construction camps.

In the communities

The social impacts of the Medupi boom have largely been visited on poor areas. Marapong's population exploded. The main construction camp is at the single entrance, two shack settlements sprouted like wings on either side where there were previously parks and people crowded into accommodation rented from residents in the township. Some men came with their families. Many more arrived alone. Amenities did not expand to match the growth in population. The entrance is totally congested at rush hour, there are longer queues for treatment at the clinic and classrooms are overcrowded.

This is no longer a place to bring up children, says Andries Mocheke of the Waterberg Environmental Justice Forum (WEJF). Many of the construction workers are living fast and hard. Drug dealers followed them in and more



shebeens have opened. They are packed out and spilling onto the street, especially on pay days. The men are drunk and high and sex workers are on the road. Kids from a local primary school have to walk past a row of shebeens to get home.

Of the men from Marapong who got work at Medupi, former school principle Zach Radipabe notes two types: responsible men yearning for work who made good with Medupi jobs; and those who squandered money on clothes and cars to show off wealth. The young ones were more easily influenced by the latter. Everyone wanted a fast buck. The dropout rate from schools increased dramatically. Some of the boys got work at Medupi, others turned to crime. Girls also dropped out. As Radipabe puts it, the men from Medupi started looking at girls like they were women and more girls were made pregnant. Bettie Kgageng notes increased rates of HIV infection as well as TB.

The scale of social disruption is as marked in the villages of Ga Seleka and Shongwane. The school dropout rate is such that matric classes have emptied out. Tebogo Mocheko did matric in 2011. There were then 99 matriculants and five boys dropped out to work at Medupi. In 2018, there are only 33 matriculants at the school. Half of those who drop out are boys trying for work at Medupi. The next group of dropouts are girls who have been made pregnant and a third group is composed of boys and girls who are hooked on drugs. As in Marapong, there has been a sharp increase in the incidence of HIV.

In Ga Seleka, most of those who have not got work on Medupi survive on social grants or food parcels. Older people are still working the fields but younger people are not learning from them. For school leavers there are few prospects. Even if they do well in matric, the nearest tertiary college is in Lephalale. A return trip by bus is R62. In this context, dropping out for a job at Medupi is understandable. It may well be a once in a lifetime opportunity. But there is nothing after that.

Mocheko is a member of Matjoba, an organisation of young women working against the patriarchy that makes women dependent on men with money. "Girls chase after men with work," they say. Girls are also abused. Part of their



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programme is to support women who have been raped. With Matjoba, the young women choose not to be victims.¹⁰⁶

Violence against women is on the rise, part of a wave of crime brought in with the boom. There is a loss of security which reflects also a loss of community. Before, comments Elana Greyling of Earthlife, “there were crimes and bad things happening, but you trusted most people, because you knew them. It was where you would want to raise your kids.” Molokomme echoes the sentiment. Everybody used to know each other. Even across the racial divides there was enough trust for people to feel safe. “Now we are afraid of each other.”

Bust

The bust is coming on fast. Inside the plant, there is growing pressure for completion of tasks but management is said to be nervous about announcing key target dates such as for the synchronisation of generators to the grid or for bringing units into commercial production. As noted above, completion deadlines seem designed to guarantee early delivery. That may also be intended as a strategy to manage a volatile workforce whose reaction cannot be anticipated by management.

Everyone fears the bust. The population will shrink but not back to pre-boom numbers. Snyman thinks maybe 10 000 households will remain in Lephalale town. That implies a population of about 40 000, down from over 45 000 but still about double the pre-boom number of 20 000. As noted above, Lephalale’s inflated property market is about to crash. Municipal revenues will also shrink, exposing the municipality’s vulnerability and likely pushing it into the red.

Unemployment will rise sharply. While we heard conflicting views on whether the Medupi boom reduced or increased unemployment, it is certain that the unemployment rate will be much higher after the boom than before it. If unemployment was the problem, the Medupi boom has made it worse. In consequence, local people anticipate a sharp increase in crime. This was not

106 Tebogo Mocheke, Mmule Kgang, interview 18 April 2018.



a big issue before 2007. It came in with the boom and will get worse with the bust.

Many of those who came to Marapong or Ga Seleka to seek work on Medupi are staying on after being demobbed as there are rumours of new projects, of the next boom to be driven by the construction of new mines and power stations. And people are still coming in, says Mogol Pos editor Leoni Kruger, responding to internet scams promising jobs in return for a fee. They join the pool of people from which the mayor can draw support. Every EIA consultation meeting is then treated as if it were a recruitment meeting and people are led to believe that they are registering for work when they put their names down. Those who ask critical questions are branded as anti-development, say the WEJF activists. The mayor tells people, “They don’t want you to find work.”¹⁰⁷

It is not just the workers who are waiting for the miracle of the next boom. “Something big needs to happen to make a big difference – to soak up unemployment,” says Basson. “It needs big industry and it needs to be corruption free ... but we are very remote for big industry.” The municipality’s dream of becoming the energy hub of Africa appears as something big. There is a line-up of projects proposed by Independent Power Producers (IPPs) and associated coal mines, including the Mmamabula project over the border in Botswana. Snyman observes that the prospects are uncertain and, if it happens, there will be no more mines or power stations after 10 or 20 years. The IPPs will be the last throw of the dice. The municipality’s IDPs, however, show no Plan B. It is the miracle boom or it is bust.

107 Leoni Kruger, interview 13 April 2018; Andries Mocheko and Lucky Letlhora, interview 14 September 2018.



Box 3: Replumbing the Waterberg

Having started a spiral of degradation in the Mokolo River, the developers of the Waterberg coalfield are now planning to create a new artificial river, which will bring some of the dirtiest water in South Africa into the Waterberg. The Mokolo Crocodile Water Augmentation Project phase 2A (MCWAP2A) is a mega project all by itself, and the latest of 30 inter basin transfers that have resulted in a massive replumbing of South Africa's rivers.

Inter Basin Transfers (IBTs)¹⁰⁸ take water from one river system or catchment and deliver it to another. At last count South Africa had 29 inter basin and inter river system transfer schemes with a total transfer capacity of 7 billion cubic metres a year, making it one of the most seriously replumbed countries in the world. Only one of South Africa's nine Water Management Areas does not have an inter basin transfer scheme. Many of these transfer schemes bring water to Eskom's coal-fired power stations.

The best known IBT is the Lesotho Highlands Water Project (LHWP), which supplies water to Gauteng's Vaal Water Management Area through transfer from the Katse and Mohale Dams in Lesotho. Design and planning work for Phase 2 of the Lesotho Highlands Water Project has commenced. It centres on building the Polihali Dam on the Senqu River downstream from Katse and the Department of Water and Sanitation (DWS) says it will transfer an additional 465 Mm³/a to South Africa, starting in 2022/3.¹⁰⁹ Inter Basin Transfer schemes suffer from all the pathologies of the mega project, including corruption and ignoring the impacts on local people's livelihoods and ecosystems. In 1999, massive corruption was discovered on the LHWP when more than 12 multinational firms and consortiums were found to have bribed the CEO of the project.¹¹⁰

IBTs hold major ecological risk, as they connect rivers with different ecological characteristics and mix ecosystems and biota (living creatures)

108 The term is from Fred Pearce's 1992 book *The Damned*, in which he traces the political and ecological realities of Inter Basin Transfers.

109 DWS. 2017 Strategic Overview of the Water Sector in South Africa. http://www.dwa.gov.za/downloads/WS/P_1/Adhoc/AWensley/2017%20SOWS_A6_12%20Oct%202017_print%20crop.pdf

110 <https://www.internationalrivers.org/resources/lesotho-water-project-corruption-3662>



with unpredictable consequences for biodiversity. They also change flow regimes, habitat conditions and water quality. In Lesotho, the flow of the Senqu – the upper Orange – is already substantially reduced and building the Polihali dam will leave little more than a trickle downstream. River ecologists are questioning the rationale behind IBTs as well as pointing to the impacts.

Eskom’s 2018 Annual Report indicates that the MCWAP2A, while based on ‘surplus effluent’ from the Hartbeespoort Dam, will ultimately depend on water from Lesotho. It cautions that late commissioning of the LHWP Phase 2 run would threaten Eskom’s water security and, if MCWAP doesn’t deliver, Medupi would be short of water for its flue gas desulphurisation plants which must be operational by 2024. “Failure to commission the FGD plant within the agreed timelines may render Eskom in breach of World Bank loan agreements and our emission licence, which would result in the units not being able to operate.”¹¹¹

Surplus effluent

What is the MCWAP plan? This ‘river’ would transfer clean water from the Lesotho Highlands via the moderately dirty Vaal Dam, to be processed by Rand Water and pumped over the continental divide created by the Witwatersrand. While the water to the south of this divide flows into the Vaal and down to the Atlantic Ocean, the water pumped to the north of the continental divide ultimately flows down the Limpopo to the Indian Ocean.

But before then, this water will pass through the hands and machines of thousands of businesses and the bellies of millions of people, then through nine sewage works serving parts of Johannesburg, Midrand and Krugersdorp, and then end up in the Hartbeespoort Dam. The dam is not able to handle this urban effluent. Even if all the sewage works in the catchment were compliant with regulations (which they are not), the dam would still be eutrophic – that is, suffocated by too many nutrients, not only from the struggling sewage works, but also from broken sewer pipes and

111 Eskom AR 2018: 86.



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pump stations, from package plants¹¹² serving housing estates and malls, from dirty pavements and surfaces and from informal settlements without sewers or solid waste removal.

Considerable efforts have been made to deal with the issue but so far without success. A programme started in early 2008 – the Hartbeespoort Dam Integrated Biological Remediation Programme, also called *Harties Metsi a Me* – and costing DWS up to R500 million by 2015, was not effective, according to researchers Hart and Mathews. They argue that it is no use trying to address the symptoms in the dam. What is needed is “fully integrated catchment management of nutrient and other contaminant inputs” to prevent eutrophication [2018: 106]. For now, the alien water hyacinth thriving on the excess of urban nutrients, has taken over the dam, sucked the oxygen out of the water and left a stench for damside residents.¹¹³

The MCWAP plan is to collect ‘surplus effluent’ from this dam and release it down the Crocodile River. It is indeed effluent: DWS planners wrote in 2015 that the water to be transferred from the Crocodile River “is of poor quality due to it being return flows from Waste Water Works”.¹¹⁴ It is then meant to flow down the Crocodile River – which is already hammered by iron, platinum, gold, chrome, manganese and diamond mining, intensive farming and industry – to Vlieepoort, 10 km outside Thabazimbi. There it is to be lifted by a pump station into a pipeline running approximately 100 km along the existing road and railway line, crossing the Matlabas River – which will be exposed to occasional water releases due to maintenance and accidents – and delivered to paying customers in the Waterberg, principally Eskom, Exxaro and the Lephalale municipality.

112 They are called package plants because these are small installations not designed for particular sites but taken “out of the box”. Package plants often escape regulation.

113 Hart and Mathews also report that 75% of South Africa’s inland waters (by volume) are eutrophic by international standards.

114 DWS. 2015. The Development of the Limpopo North Water Management Area Reconciliation Strategy. Literature Review. Final, December 2015.



'Refuse MCWAP!'

In September 2018, Earthlife Africa and groundWork urged the DEA to refuse the environmental authorisation for MCWAP2A, on the grounds that

- the need and desirability of the project has not been established;
- the Draft Environmental Impact Report (DEIR) did not adequately assess the impacts of the project on rivers, wetlands and ecosystems or account for the reserve as required by the National Water Act of 1998;
- the DEIR failed to adequately assess the climate change impacts of the project;
- it failed to properly assess cumulative impacts of the project;
- it failed to assess the indirect and socio-economic impacts of proceeding with MCWAP2A; and
- it failed to accurately consider alternatives to the project, including the no-go option, or to follow the precautionary principle as required by the National Environmental Management Act (NEMA) of 1998.

The organisations argued that internationally, and in South Africa, a transition from coal is inevitable and that access to electricity can be more cheaply and reliably provided by renewable energy sources. Hence, there is no need for any new coal mines or coal-fired power stations in South Africa and no need for MCWAP water for them. The need for water for FGDs is self-inflicted as there are other FGD technologies that use less water. In addition, they have long argued that there is no need to complete Medupi. The revised MCWAP plan is not based on the latest plan for electric power – the draft IRP 2018 [see Box 5] – but on earlier plans with grossly exaggerated electricity demand forecasts. The draft IRP itself exaggerates future demand, but less so, and unreasonably forces in two IPPs – Thabametsi in the Waterberg and Khanyisa in eMalahleni – despite the fact that coal-fired power does not make the cut in a 'least cost' power system, and despite the climate change and health risks they pose. MCWAP makes provision for Thabametsi's water supply.



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The DEIR acknowledges that the project would have direct impacts on water quality and quantity, aquatic habitats, and the species dependent on the habitat. It acknowledges that changes in the supply of water downstream can substantially reduce the value of goods and services derived from the adjacent riparian areas, wetlands, pans and drylands, through impacts on crops, livestock, wildlife and birds.

However, Earthlife Africa and groundWork argue that the DEIR has not adequately assessed the project's impacts on the hydrology from abstraction from the Crocodile River, the scouring and ecological contamination that spills from the pipeline could cause to the ephemeral Matlabas River, and the ecological results – including water quality, sediment regime, transfer of biota including the pest water hyacinth – of transferring this water into the Mokolo catchment. The Hartbeespoort Dam is in a poor state with frequent blooms of algae and water hyacinth giving rise to the concern that these species will be transferred into the recipient catchments. The Crocodile River is also in a poor condition, as reflected in the 2005 River Health Report which points out that only the hardiest fish species survive. The invasive water hyacinth is already being carried via the Crocodile into the Limpopo.

The two organisations also object to impacts on wetlands and sensitive species within the wetlands, and other aspects of environmental impact that were not properly addressed. Most importantly, the no go option is not seriously entertained. For all the science and consultation that went into this report, it treats the building of the pipeline as a foregone conclusion.

Pipe dream

But is it? Like many mega projects, the pipeline is starting to look less convincing as financial commitments need to be made. The shrinking prospects for the expansion of mining and industry on the Waterberg coalfield [see Chapter 4] are reflected in a shrinking pipeline. At the height of ambition in 2009, the MCWAP pipeline was planned to bring, by 2030,



an additional 198 Mm³/a into the Waterberg.¹¹⁵ This figure has now been revised down to 75 Mm³/a.

These plans were laid on top of the water regime created in Boom 1 and maintained through to the 2000s. In this period, water use had stabilised within the capacity of the Mokolo Dam, at around 28.6 Mm³/a as shown in Table 4. Farmers were still using 16.0 Mm³/a for irrigation, that is 5.6 Mm³/a more than their allocation. Present water policy for the area is to restrict them to 10.4 Mm³/a. In 2004 it was reported that irrigation in the Vaalwater area – in the Waterberg Mountains upstream from the Mokolo Dam – had decreased as a result of game farming [DWS, 2015].

Table 4: Summary of major point-source water requirement, allocations and return flows in the Mokolo River System in 2004¹¹⁶ (Mm³/a)

Name	Allocation	Actual Water Use	Return flows to river
Vaalwater town	0.0	0.0	0.0
Grootegeeluk coal mine	9.9	3.4	0.0
Matimba Power Station	7.3	3.0	0.0
Lephalale & Onverwacht	10.00	3.3	1.0
Marapong		0.5	0.3
Irrigation downstream of dam	10.4	16.0	0.5
TOTAL	28.6	26.2	1.8

Source: Limpopo Water Management Area North Reconciliation Strategy.

Both Matimba power station and Grootegeeluk mine were using far less than the water they have been allocated: the power station 3.0 out of 7.3 Mm³/a, and the mine 3.4 out of 9.9 Mm³/a. This may mean – as Exxaro managers argue – that they use water efficiently. But it may also mean that they managed to secure oversized allocations when the Mokolo Dam was built, in

¹¹⁵ NEMAI Consulting for DWS, 2010

¹¹⁶ DWS 2015. Literature Review for Limpopo Water Management Area North Reconciliation Strategy.



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effect capturing water that would enable their future expansion. The table shows that Onverwacht and Lephalale, with about half the population of Marapong, used more than 6 times the amount of water used by Marapong. The table does not show any allocation for the ecological reserve, estimated at 17 Mm³/a, casting further doubt on how real this reserve is [DWAF 2004].

In 2008, DWS commissioned the first MCWAP feasibility study, which was completed in 2010. It planned for three phases. The first was to augment the supply from Mokolo Dam for the interim period until a transfer pipeline from the Crocodile River could be implemented. Phase 1 has been operational since June 2015. It consists of a 46 km pipeline, parallel to the existing pipeline, that is able to take 30 Mm³/a from the Mokolo Dam – that is, just more than the Mokolo Dam’s 28.6 Mm³ annual yield.

The second phase (MCWAP2A) is constructing the pipeline to transfer water from the Crocodile to the Steenbokpan and Lephalale areas, as described above. Construction is to be done by the Trans Caledon Tunnel Authority (TCTA) and is estimated to cost R13.9 billion. The third phase will be the ‘de-bottlenecking’ of the existing Exxaro pipeline from the Mokolo Dam to Lephalale, by constructing an underground, gravity pipeline to improve the hydraulic gradient and so enable more flow.

Rand Water already transfers large amounts of water into the upper Crocodile catchment to provide water to urban areas including Johannesburg North, Midrand and the City of Tshwane. The return flows of this water would in any case flow via the Crocodile to the Limpopo, says TCTA planner Richard Holden. However, an appendix to the 2018 MCWAP DEIR¹¹⁷ reveals that, with the regular withdrawal of ‘surplus effluent’, the Hartbeespoort Dam would have a shrinking shoreline in winter as water levels drop by up to 6 m to reveal mud plains of up to 800 ha, leaving the boats of the damside residents high and dry.

117 See MCWAP 2a Draft EIA, Hartbeespoort Dam specialist page 296, plus Appendix 18. [https://www.nemai.co.za/documents/MCWAP/MCWAP-2A/dEIA/10580-20180920-MCWAP-2A%20WTI%20EIA%20Report%20\(Draft\).pdf](https://www.nemai.co.za/documents/MCWAP/MCWAP-2A/dEIA/10580-20180920-MCWAP-2A%20WTI%20EIA%20Report%20(Draft).pdf)



In 2009, MCWAP Scenario 9 was developed and used as the basis for planning. It envisaged the maximum development of what we have called Boom 3, including Eskom’s Coal 3 and 4, Sasol’s Mafutha and a raft of Independent Power Producers (IPPs). It put water demand for the year 2030 at more than seven times the yield of the Mokolo Dam.¹¹⁸

Table 5. Total annual water requirements Mm³/a for major water users

Year	2009	2010	2011	2012	2013	2014	2015	2020	2025	2030
Eskom	4.3	4.3	4.9	6.8	9.3	10.9	14.3	50.9	77.6	77.6
IPP’s	-	0.4	0.9	0.9	1.5	4.4	13.2	15.6	15.6	15.6
Coal Mining (power)	-	-	1.1	2.7	4.4	5.3	6.8	14.1	20.0	20
Exxaro Projects	3.0	3.2	3.7	4.7	6.6	9.2	10.8	16.9	16.2	19.2
Sasol (Mafutha 1)	-	-	0.4	6.1	6.6	9.9	25.2	43.5	43.5	44.0
Municipality	5.6	5.9	7.7	10.4	12.0	13.6	14.5	20.4	21.2	21.6
Total	12.9	13.8	18.7	31.7	40.4	53.4	84.8	161.4	194.1	198.0
Irrigation + Mokolo River	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Total + Irrigation	23.3	24.2	29.1	42.1	50.8	63.8	95.2	171.8	204.5	208.4

Source: Nema Consulting Final EIA Report for MCWAP Phase 1. [2015e].

Since 2010, however, these plans have started to look more tenuous. MCWAP2A was put on hold because the Integrated Resource Plan (IRP 2010) showed a more modest increase in coal-fired power and associated water use than previously anticipated. Then, in 2013, Sasol cancelled Mafutha – its plan to build a coal-to-liquid fuel plant at Steenbokpan. In September 2018, DWS published a new Draft Scoping report. The new plan takes into account that the TCTA, tasked with building the pipeline, is only interested

118 See MCWAP Final EIA Phase 1. [http://www.dwa.gov.za/Projects/MCWAP/Documents/FinalEIAphase1Appendices/EIA%20Report%20\(Final\)%20-%20MCWAP%20Phase%201%20Sept2010.pdf](http://www.dwa.gov.za/Projects/MCWAP/Documents/FinalEIAphase1Appendices/EIA%20Report%20(Final)%20-%20MCWAP%20Phase%201%20Sept2010.pdf)



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in accommodating customers who have money to invest in the pipeline. This is the result of Treasury's strict control over their plans, says Holden. Currently there are only three such customers, namely Eskom and Exxaro and the DWS, which is prepared to pay for additional water for the Lephalale municipality. The projection of overall water demand has shrunk by almost half from 208.4 in the 2009 plan, to 111.3 Mm³/a in the 2018 plan. The TCTA now plans to build a pipeline capable of delivering 75 Mm³/a, which will be added to the 29.4 Mm³/a from the Mokolo Dam.

Table 6. Revised water demand projections for MCWAP-2A

User Group	2019	2020	2025	2030	2035	2040	2045	2050
Eskom	11.90	14.00	19.00	26.60	26.60	26.60	26.60	26.60
Exxaro	12.02	13.02	15.62	16.15	16.15	16.15	16.15	16.15
Committed Users: Eskom & Exxaro	23.92	27.02	34.62	42.75	42.75	42.75	42.75	42.75
Lephalale municipality	11.96	12.47	13.02	14.08	13.97	14.02	14.20	14.39
Committed users incl. municipality	35.88	39.49	47.64	56.83	56.72	56.77	56.95	57.14
IPPs & other DoE Future users	5.86	10.60	24.51	40.18	43.79	42.99	53.79	53.79
Total requirements¹¹⁹	42.14	50.49	72.55	97.61	100.91	100.16	114.14	111.33
Capacity MCWAP1	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4
Volume required in MCWAP-2A	12.74	21.09	43.15	68.21	71.51	80.76	84.74	81.93

Adapted from Sept 2018 scoping report, p. 13.

¹¹⁹ Incl. incidental users – Hence, figures in this row do not add up.



Several points stand out. First, irrigation farmers do not appear in this table. Their allocation of between 10.4 and 16 Mm³, which should be part of the yield of the Mokolo Dam, is not provided for as the full yield of the Mokolo Dam is allocated to other water users. Second, Exxaro numbers indicate commitments to further coal mining. Third, the projected demand for 'IPPs and other DoE future users' – nearly half MCWAP's total provision – is unfounded and vanishingly unlikely. Assuming that Treasury's 'strict controls' actually do apply, 53 Mm³/a should be subtracted from the total. That would shrink the pipeline a good bit more – from 82 to 29 Mm³/a. Fourth, the projected demand for the 'committed users' – Eskom, Exxaro and the municipality – also appears to be exaggerated.

However, it is Eskom's needs that are put forward as the core reasons for the MCWAP pipeline. These are the water demands of the Flue Gas Desulphurisation (FGD) units, and the 'strategic' need to make Matimba and Medupi's water supply secure, in case the Mokolo Dam supply fails. Eskom has argued that wet FGD is the best technology choice and that, anyway, Medupi has also been physically constructed to allow for the installation of wet FGD devices only, so that alternative technology choices are simply no longer possible. It seems remarkable that the FGD water requirements of around 7 Mm³/a, would drive the need for such a drastic intervention as the MCWAP pipeline. According to Tyrone Singleton, an Eskom environmental manager:

Estimates indicate that Medupi's long term steady state water demand will be approximately 6 Mm³/a without FGD being installed... (while) estimates of the water requirements for 6 wet FGD plants (i. e. on all 6 Medupi units) with 90% removal efficiency and no water efficiency initiatives range from 6.5 to 7.2 Mm³/a. Estimates of the water requirement for a FGD system on 3 units range from 3.2 to 3.9 Mm³/annum ... The addition of coal washing at the mine to supply Medupi with coal increases the total industrial demand associated with Medupi to approximately 18.7 Mm³/a. Currently, only 5 Mm³/a of water is



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available and it is predicted that this allocation will be exceeded with the commissioning of Medupi's third unit in 2012 [2010: 81].

There are other options. Civil society has long argued that it would make sense not to complete either Medupi or Kusile, due to excessive cost. This would bring down water demand and avoid the need to build the pipeline. Beyond Medupi, the planners need to realise that the Waterberg Boom 3 is more likely to become a scrapyard of dreams than a bright mega project reality.



4

Boom Three

In 2010, as construction workers flocked into Lephalale, it was anticipated that the construction boom would continue from one project to the next. Sasol was doing a feasibility study for a new coal-to-liquids (CTL) plant while Eskom was looking at Coal 3 and Coal 4, two new power stations to follow Medupi and Kusile. And there was “some talk” of Independent Power Producers (IPPs) building additional power plants according to Hermanus et al [2010b: 22]. Local leaders still hope for a third coal construction boom if for no other reason than to deal with the consequences of the last one. The prospects, however, are diminishing.

The site of the hoped for boom is Steenbokpan. According to a 2016 Spatial Development Framework for the area, “Nine parcels of farm land consisting of approximately 57 individual farm portions have been purchased by seven mining chambers.”¹²⁰ The boom would attract ever more people into the area and, as noted above, the 2013 Lephalale CBD development plan anticipated that the town’s population would grow from 43 866 in 2011 to 77 930 in 2020 to 129 595 in 2030. With 2020 just a year away, it is clear that the forecast is way off.

The municipality, however, is not seriously revising its plans. The next miracle boom, after all, has been ordered up by national government. The National Infrastructure Plan outlines 18 strategic infrastructure projects (SIPs). These SIPs all contain many individual projects and encompass pretty much all capital spending by the state as well as several projects which are to be funded by private corporations. As we observed in the groundWork Report 2014, some SIPs are urgently needed and include refurbishing hospitals and clinics, schools, universities and libraries and upgrading water, electricity

¹²⁰ Lephalale Local Municipality, *Steenbokpan Local Spatial Development Framework Plan 2016* (Draft).



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and sanitation bulk infrastructure. But the infrastructure plan opens with five grandiose 'Geographic SIPs' and SIP 1 – 'Unlocking the northern mineral belt with Waterberg as the catalyst' – is about extracting coal and platinum. It proposes extending the heavy haul coal line to connect the Waterberg to the Mpumalanga power stations and the Richards Bay coal export terminal. It links to energy SIPs which envisage the expansion of privatised IPPs across the Steenbokpan. And it requires the MCWAP to bring in the water required for IPPs and coal mine washeries. Much of this grand plan stalled almost as soon as it was announced in 2012. But SIP 1 hovers like a mirage over the landscape, promising Boom 3 and paralysing all else below it.

In this chapter, we look at the projects that were to create the next boom and consider the prospects for their success. Before they start, however, these projects have already had a major impact on Steenbokpan. We conclude the chapter by looking at the impact on the farms and on the people of Leseding, the shack settlement that has already been created at the geographical centre of Boom 3.

Sasol's Mafutha

In 2006, the price of crude oil was rising rapidly and Sasol was making windfall profits from its coal-to-liquid (CTL) plant in South Africa. It was then planning to develop two 80 000 barrel a day CTL plants in China, lobbying the US government to support new synfuel plants and 'in talks' with the Indian government. It was also building new gas-to-liquid (GTL) plants in Qatar, in partnership with state owned Qatar Petroleum, and in the Niger Delta in partnership with Chevron.

In South Africa, crude oil is imported and government regulates the petrol price to give the oil refineries a profit while Sasol gets 'import parity' prices. Since Sasol makes fuel from coal and mines its own coal, its costs are not affected by crude oil prices. It makes a loss when the oil price is low and, for most of its history, it received massive subsidies from the 'fuel equalisation fund' to cover the losses. It started making profits in the 2000s but claimed that the subsidy regime had been terminated and it was therefore not obliged to pay back into the equalisation fund.



Box 4: Lephalale coal line

Moving coal is costly and the only viable way out of the Waterberg is by rail. The coal line starts at Grootegeluk and runs south through Thabazimbi to Rustenburg where the line also picks up chrome trains. It then turns east to go through Pyramid, north of Pretoria, where the line picks up general freight. It goes on to Ogies where it joins the main coal rail network. From there, coal trains go on to the major coal junction at Ermelo, where they can join the export coal line to Richards Bay, or they may be dispersed to the Highveld power stations.

In 2012, Transnet planned a massive expansion of infrastructure under its Market Demand Strategy. The plan was based on building infrastructure ahead of demand. That meant forecasting demand and building accordingly – ‘build it and they will come’ – with the inevitable risk that the forecasts are exaggerated and the demand does not materialise. That risk is no doubt elevated by the political ambitions of government ministers – the expansion of the coal line is Transnet’s part in SIP1: ‘unlocking the minerals potential of the Waterberg’.

The Phase 1 expansion has six stages which were to start in 2012 and be completed in 2017, increasing the total capacity of the line from 3 million tonnes a year to 23 Mt/y and increasing the export coal capacity from 400 000 to 7.3 Mt/y. This was to be followed by Phase 2 with the construction, starting in 2018, of a dedicated heavy haul coal line direct from Thabazimbi to Ermelo and extending beyond Lephalale into Botswana. This would lift total capacity to 80 Mt/y by 2040 with coal exports at 33 Mt/y and another 16 Mt/y of thermal coal destined for Eskom’s Highveld power stations.

Thus far, only Phase 1 Stage 1 has been completed. This involved the expansion of the Matlabas ‘loop’ about half way between Lephalale and Thabazimbi. The loop is simply a piece of track parallel to the main track, that allows trains to pass each other. It has been expanded to take a 100-wagon train in place of a 50-wagon train and enables Transnet to run more trains as well as longer trains. Hence, it has raised the capacity for coal from 400 000 t/y to 2 Mt/y. According to Transnet’s 2018 Annual Report, it has funding for



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Stage 2 which will “grow [coal] capacity to 6.3 Mt/y ... by using additional loops” and upgrading various bits of the line and shunting yards.¹²¹

Stages 3 to 5 include even longer loops to take 200 wagon trains, creating some double line sections and electrifying the line from Thabazimbi to Lephalale so as to avoid having to change engines. However, Transnet is still to do feasibility studies on these stages. Meanwhile, Transnet’s Market Demand Strategy forecasts have indeed been exaggerated in each of the six years since 2012. On its own account, “the economic growth ultimately anticipated for the MDS period did not materialise” and nor did the funds for investment. Instead, it got a credit ratings downgrade leading to higher financing costs.¹²² Hence, it has dumped the ‘build it and they will come’ approach and is now building only in response to ‘validated demand’.

It is not quite clear what that means. Previously, Transnet has required ‘take or pay’ contracts from coal companies – meaning, that they pay rail costs whether or not they use it – before expanding capacity. ‘Validated demand’ seems somewhat less certain. Nevertheless, the only demand that could be said to be ‘validated’ on the Waterberg coal line is from Exxaro. In 2017, Transnet and Exxaro “concluded a 10-year agreement ... to transport a total of 7,8 Mt of export coal, of which 3 Mt will come from the Waterberg”. In short, Exxaro is using the full capacity of the line. Resgen says it has a “logistics solution agreed with Transnet”, but that sounds less than a hard contract and scarcely amounts to the ‘validated demand’ that would justify building additional capacity on the line.¹²³

Transnet’s expansion included buying 1 064 locomotives, 591 of which were supplied by China South Rail (CSR) with financing from the China Development Bank (CDB). The deal was lubricated by Transnet’s advisers, Regiments Capital, a company put in place by the Guptas for the purpose of looting those they advised. On the account of the investigative reporters at amaBhungane, “Transnet got ripped off at least three times: by Regiments

121 Transnet AR 2018, p.88. See also Market Demand Strategy 2012; and LTPF 2016.

122 Transnet AR 2018, p.44.

123 Exxaro AR 2017, p.25; Transnet AR 2018, p. 89, says the contract is for 7.6 Mt from the Waterberg – which is clearly wrong since they don’t have that capacity; Resgen AR 2018, p.5.



and the Guptas, by the locomotive suppliers and finally by CDB, whose overpriced loan will not be repaid until 2030.” CSR was massively over-paid for the locomotives while the Guptas got over R5 billion in kickbacks.¹²⁴

Government seemed not to agree. In 2006, then Finance Minister Trevor Manuel ordered a Treasury investigation which recommended that Sasol be slapped with a tax on its windfall profits. Sasol responded by suggesting that further subsidies would be more appropriate as crude oil production was in decline and it was producing ‘alternative fuels’ with massive savings on foreign exchange. Treasury apparently accepted this argument and dropped the windfall tax when Sasol committed to developing Project Mafutha, an all new 80 000 barrel a day CTL plant.¹²⁵ Like Sasolburg and Secunda, the plant would come with a whole new town. Steenbokpan, where the company started buying up land, was the favoured site. Over the next few years, according to locals, Sasol managers acted as if they already owned their next company town.

Following the 2008 financial meltdown on Wall Street, the oil price spiked even higher to US\$148 a barrel as if commodities might provide investors with a safe bet. They did not. Prices collapsed to \$35 and it took three years of volatile trading before prices recovered to swing between \$100 and \$120. Nevertheless, rising oil prices no longer looked like a safe bet, particularly since the fracking boom was taking off in the US. In 2012, Sasol determined on “prudent investment decisions” which meant that it would be cautious about investing in expensive new CTL projects but would focus instead on not-quite-so-expensive GTL. A year later, Sasol entirely abandoned the new CTL projects “to focus singularly on accelerated GTL growth”¹²⁶ and invested heavily in its Lake Charles mega project in Louisiana, USA, to capitalise on the cheap gas produced by the fracking boom. It framed this as a response to climate change

124 Susan Comrie, *Guptas siphoned R100m-plus from China loan, evidence shows*, amaBhungane, 10 September 2018; amaBhungane & Scorpio, *The Great Train Robbery, Part One – the Zurich trust*, 9 March 2018 & *The great train robbery Part 2 – The choo-choo switcheroo*, 23 March 2018.

125 Sasol press statement, *Sasol welcomes decision on windfall tax*, 6 August 2007.

126 Sasol Annual Report 2012: 11 and 2013: 9.



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but, since GTL is the next most carbon intensive option after CTL and fracked wells have a propensity to leak methane, the combination may be worse.

The oil price crashed again in 2014 and again in 2015, hitting a low of under \$30 and wiping out any advantage from using cheap gas as a feedstock. The price then increased to between \$45 and \$55 in 2017 but, at the end of the year, Sasol concluded that “sustained volatility in both oil prices and exchange rates” should be expected and abandoned GTL as the main ‘driver’ of growth. Its new “value-based growth strategy” would instead “leverage our core strengths in specialty chemicals, exploration and production (E&P) and retail fuels”.¹²⁷ Hence, it will complete the very large chemicals plant at Lake Charles – already over time and over budget and with another \$130 million added to fix the damage done by Hurricanes Harvey, Irma and Nate – but will not build the new GTL plant that was to follow. It has thus abandoned the ambition to turn Lake Charles into “an integrated, multi-asset site similar in concept to our flagship Secunda facility” as promised just one year earlier.¹²⁸

In 2018, the oil price is once more on the rise, reaching \$75 in July and with investment touts predicting \$100, so it remains to be seen whether Sasol sticks with this latest strategy. In southern Africa, however, it is indeed focusing on exploration and production, with expanded gas extraction from Mozambique to feed its plants in Secunda and Sasolburg and a destructive exploration campaign off the KwaZulu-Natal coast.

Of Project Mafutha, there has been little mention since 2010 when Sasol reported that:

Another important feature of the year was the successful coal blasting and extraction of a 170 000 ton sample of coal for Project Mafutha (a proposed greenfields CTL facility in Limpopo Province). This coal will now be tested in Secunda for its suitability for gasification.¹²⁹

127 Sasol media release, *Sasol unveils strategy drive future value-based growth*, 23 November 2017.

128 Sasol Annual Report 2016: 103.

129 Sasol Annual Report 2010: 32.



For the bulk sample pit, Sasol removed 34 m of ‘overburden’ and dug out another 91 m to extract coal. Given the character of the coal resource with many layers of ‘interburden’,¹³⁰ it will have left as much as it carried away. Local people say that the coal trucks ran in a seemingly unending convoy for over six months from July 2009. At that time, the vision of modernising development led by industry conjured up a new town with 16 500 households and a population of 60 000 with 4 667 jobs at Sasol and a host of supporting jobs in the town [Hermanus et al 2010b: 21]. Nair et al lament the loss of this dream: “Having headed off the possible windfall tax, it appears that certain projects will not be pursued without very substantial participation and support from the state” [2015: 14]. What is left is a large hole in the ground and a broken road. Local people also note that the groundwater source is diminished and speculate that this too might be because Sasol’s pit is drawing it down.

Sasol has made no public statement on the results of the test burn, but it has kept hold of the land and mining rights. In 2013, Sasol managers told a local meeting that, depending on the availability of water, rail transport and a market for thermal coal, it would partner with Exxaro to develop a very large scale mine with an 80-year lifespan.¹³¹ That would take it to 2100. Quite how Sasol reconciles even the idea of that with its proclaimed concern about climate change is beyond us. Assuming that it and its peer corporations are successful in their plans and projects, the world will by then be some 4°C hotter than now and Steenbokpan will be around 8°C hotter.

Eskom Coal 3 and 4

A third and even a fourth new giant six-pack coal plant, following Medupi and Kusile, were anticipated in 2010 and Eskom identified three parcels of land south of Steenbokpan village to locate them and the associated mines. Hermanus et al reckon on 1 900 full time workers for each combined power station and mine, with additional maintenance contractors. This corresponds

¹³⁰ Interburden is earth lying between coal seams.

¹³¹ Valerie Cilliers, *Sasol lays out its plans for Steenbokpan*, Northern News, 4 July 2013.



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to a population of 10 000 in 2 500 households [2010b: 23] – 20 000 for the two – perhaps housed in Sasol’s new town at Steenbokpan,

The possibility of Coal 3 and 4 rested on Eskom’s assumption of escalating demand for electricity. In March 2008 – before Wall Street finally crashed – Eskom said it would need to double generation capacity to 80 000 MW by 2025 at a total cost of some R1.3 trillion.¹³² As we observed at the time, “While the capacity figure looked heroic, the cost figure looked like a gross underestimate” [groundWork 2009: 13].

The next year, in September 2009, Eskom published an Integrated Resource Plan (IRP). In its view, the ‘great recession’ moderated demand growth in the short term but merely delayed the need for 80 000 MW to 2028. On top of demand growth, it showed Eskom compensating for decommissioning 11 000 MW as it started closing old stations from 2023. Its preferred scenario saw Coal 3’s six units coming online between 2017 and 2022, with Coal 4’s first two units starting up in 2026 followed by the first unit of Coal 5 in 2027. Including Medupi and Kusile, this added up to over 22 000 MW of new coal-fired capacity by the early 2030s. Another 11 500 MW would be from nuclear power while concentrated solar power (CSP) would provide 5 000 MW. There was no wind or solar PV. Savings from ‘demand side management’ – such as supporting energy efficiency – amounted to only 5 400 MW.

One year on, the DoE finally managed to do its own IRP for the period 2010 to 2030 but with lots of help from the MEC A list. Eskom, Anglo American, BHP Billiton, Exxaro, Sasol, Xstrata and the Chamber of Mines were all represented on a ‘technical reference committee’ convened in secret by the DoE [McDaid 2010: 2ff]. Hence, the final version of the IRP 2010, published in March 2011, looked like the MEC vision of future power in South Africa with big power plants to supply big baseload for energy intensive industries. It was immediately controversial. Like the Eskom IRP, it grossly exaggerated future demand – particularly from a proliferation of ferrochrome smelters – and it was even less ambitious in its demand side management saving. It concluded that South Africa would need 89 532 MW installed capacity by 2030.

¹³² Eskom New Build News, no.5 and Annual Report 2008 p.18.



At that time, coal was still reckoned to provide the cheapest option for new power stations but nuclear power was forced into the mix purportedly to reduce carbon emissions. The cost of wind and solar PV was still high but forecast to fall rapidly – as indeed it has done – hence justifying their inclusion. But DoE now introduced a new criterion: ‘reliable reserve margin’. In effect, conventional power was to cover peak demand with a comfortable ‘spinning margin’ and renewables could then be added on top. This made for a whopping 30% reserve margin.

The IRP 2010 therefore called for massive construction through to 2030, including 6 250 MW new coal – the equivalent of Coal 3 and half of Coal 4 – to follow Medupi and Kusile for a total of 15 850 MW,¹³³ 9 600 MW of nuclear and 17 800 MW renewables. About 10 000 MW coal would be decommissioned in the 2020s so total installed capacity in 2030 would be: 41 000 MW coal; 11 400 nuclear; and 17 800 renewables. The remainder would be made up of imported hydro, gas and peaking power plants. Renewables were regarded as a niche application, reserved for private independent power producers (IPPs), as the calculated production figures showed: in 2030 coal would produce 65% of the supply, nuclear 20% and renewables 9%. Demand-side management was kept in name only. It would displace only 3 420 MW capacity, equivalent to just 4% of the supply.

Two years later, the DoE produced an updated IRP which recognised that actual demand was already falling well below the IRP 2010 projections. The first draft showed that, with lower demand, nuclear power could be delayed if not abandoned. It also suggested reduced need for new coal, arguing that the 4 800 MW Coal 3 should be substituted by FBC plants with “a total of 1 000-1 500 MW capacity”.¹³⁴ The update process was then stalled, apparently because deleting nuclear power from the plan was not acceptable to President Zuma. The cut to coal and the associated potential for patronage may also have met with resistance within his government.

133 This does not include the three ‘return to service’ plants – Camden, Komati and Grootvlei – which together added 3 650 MW. Along with Hendrina and Arnot, these plants are all scheduled for closure before 2030.

134 DoE, Integrated Resource Plan for Electricity (IRP) 2010-2030, Update Report, 2013, p.8.



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In Lephalale, planners seem unaware of the diminishing prospects for coal-fired power. In 2013, the Lephalale CBD Development Plan opened with the claim that the town was “set to become one of the largest cities in the country, due to booming mining and petro-chemical activity”. But it quoted Eskom’s figures from March 2008 to argue that, after Medupi and Kusile, Eskom would need another 10 400 MW of coal-fired power by 2026, with the Waterberg likely to supply it. It says that “the additional power stations will consume in the region of 80 million tons of coal per year. Should all of this be sourced from the WDM (Waterberg District Municipality), open cast mining activity in the area could be sustained for about 156 years”. It also holds out for Sasol’s synfuel project some two years after Sasol dropped it.¹³⁵ Now, five years later, Lephalale’s website still reflects these aspirations. It says:

The Local Economic Development (LED) Strategy of Lephalale Municipality’s Vision for 2025 is to:

- Increase Power stations from one to five.
- Increase Coal Production from 16 million tons to more than 100 million tons per annum.
- Petro chemical industry established for 160 000 barrels per day.
- Diversified Local Economy.
- Population to double from 120 000 to 240 000.¹³⁶

The latest iteration of the IDP (2018-2019) does concede that Mafutha is “on hold” but takes no notice of it. It cites the provincial Limpopo Growth and Development Strategy which defines Lephalale “as a coal mining and petrochemical cluster” (sic) and asserts that the coal-to-liquid project “could broaden the opportunities for cluster formation” [102].¹³⁷ For power

¹³⁵ Lephalale CBD Development Plan Report August 2013, p.4 & 16, at http://www.lephalale.gov.za/documents/other_documents.php on 22 August 2018.

¹³⁶ At <http://www.lephalale.gov.za/developments/agriculture> on 22 August 2018.

¹³⁷ Lephalale Local Municipality, Integrated Development Plan 2018-2019. Page ref in text. p.102.



generation, it simply repeats the reference to Eskom’s 2008 figures – now ten years out of date – and the need for another 10 400 MW by 2026. As in 2013, it concludes “that the Municipality could host another three coal-fired power stations after Medupi” and the Waterberg fleet will then consume 80 Mt/y [113]. It sounds one note of caution: climate policy may require a reduction in carbon emissions in which case these plants may not be built [107]. But this possibility is then ignored.

Eskom’s power supply, meanwhile, flipped from shortage to surplus for two main reasons. First, contrary to the expectation of ever growing demand, demand has dropped 5% since 2012. The sharp increase in electricity tariffs, driven by the outrageous costs of Medupi and Kusile and by rising coal costs, has pushed big industry to introduce a measure of energy efficiency for the first time. At the same time, the slump in commodity prices from 2014 onwards resulted in reduced production with some plants shutting down. Second, in this context, Eskom was in surplus as soon as the first unit of Medupi was fired up in 2015. At least six units are now producing at the two plants and each one produces about as much as the whole Komati power station.¹³⁸ At the same time, Eskom improved maintenance and plant availability. Consequently, it has mothballed a number of units at Hendrina, Grootvlei and Komati and put more on ‘cold reserve’.¹³⁹ Eskom’s installed capacity is now over 46 000 MW – not including the renewable IPPs – while peak demand this winter reached 34 000 MW¹⁴⁰ – for a massive 27% reserve margin. With the completion of Medupi and Kusile, scheduled for 2022, Eskom’s installed capacity will be 54 000 MW. Hence, along with Mafutha, Coal 3 has sunk without trace – except in the Lephalale IDP.

In 2016, the DoE produced another IRP for comment and again met with a storm of protest, including from its erstwhile allies in the MEC. The demand projections were once more exaggerated, provoking even the Energy Intensive Users Group to dispute them. The DoE also put arbitrary limits on how much

138 Sikonathi Mantshantsha, *Eskom reserves boosted as Medupi and Kusile units plug in*, Business Day, 7 July 2017. Elana Greyling, *Eskom’s Medupi coal-power plant nears completion*, The Citizen, 23 June 2018.

139 Eskom Annual Report 2018, p.90.

140 Eskom Weekly System Status Report – 2018 Week 32.



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wind or solar PV could be built each year and it overstated the costs of renewables while understating the costs of coal and nuclear. It then tried to rush the consultation process and most observers concluded that it was intent on securing an outcome that favoured coal and nuclear. The DoE naturally denied the charge but extended the period for comment and then failed to meet successive deadlines for publication of the next version.

In the meantime, Zuma was unseated and the political backing for nuclear at any cost was dropped. A draft of the next version was then only published in late August as IRP 2018. It includes two new privatised coal plants despite high costs and no nuclear plants [see Box 5]. The DoE has not taken this plan to the people but relied on the internet for public comment. In the most unequal society in the world, this process excludes the majority of people, including those most affected by coal mines and power stations and the millions of people who are finding that electricity is ever more unaffordable.

In November, the parliamentary portfolio committee on energy held hearings at short notice and only for those who could afford to get to Cape Town. They heard a diversity of views and produced a report which, as Richard Halsey of Project 90 at 2030 explained, was meant to be “a fair and balanced reflection” of people’s submissions. Instead, the MPs joined the coal and nuclear lobbies, proclaiming amongst other things that “coal is our prestige”.¹⁴¹ Their report notes the Paris Agreement but ignores the implications of climate change and makes scant reference to the impacts of coal on people’s health. It demands that coal and nuclear must “remain important elements of South Africa’s energy mix”.¹⁴² This report will be forwarded to the DoE as the outcome of public consultation. As at 21 December, it is not clear if the next version will be open to discussion or simply promulgated.

141 Richard Halsey, *The IRP: Members of the parliamentary energy committee ignoring the impact of climate change*, Daily Maverick, 29 November 2018.

142 *Report of the Portfolio Committee on Energy on the draft Integrated Resource Plan 2018 (IRP 2018) public hearings*, 27 November 2018, Parliament.



Box 5: IRP 2018

Demand

IRP 2018 acknowledges that previous IRPs exaggerated future demand and sees several reasons for this, including: the failure of GDP growth; Eskom's supply shortage from 2011 to 2015; and improved energy efficiency largely in response to escalating tariffs. Tariffs are nearly five times what they were in 2007 largely because of the cost of constructing Medupi and Kusile along with rising coal costs. Eskom is now asking for 15% increases over the next three years (2019/20 to 2021/22) on top of a 4.5% increase already awarded to compensate for previous short falls. That will bring Eskom's standard tariff close to R1.50/kWh in 2021. It seems that this request is built into the IRP 2018 which shows a massive 40% real increase in tariffs over the next three years.

At the same time, Eskom is desperately trying to boost sales to soak up its surplus capacity and increase revenues – much as we predicted, in 2009, that it would do.¹⁴³ In August, CEO Phakamani Hadebe told parliament that Eskom had signed nine deals intended to boost sales. It seems that these deals offer cut price power to energy intensive industries. In short, Eskom has dropped demand side management and the IRP has followed its lead – demand side management appears only in the glossary of this plan.

The IRP is thus caught by the contradictions into which the new build has pulled Eskom – punting sales while escalating tariffs. This produces contradictory and incoherent results:

- As with all previous IRPs, the demand projection is more wishful than realistic – rising by 1.8% a year over the next decade.
- Deals for big industry leaves the bill for the new build with residential and commercial consumers.

¹⁴³ groundWork, The World Bank and Eskom: Banking on Climate Destruction! written by David Hallows, December 2009,



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- Rising tariffs inadvertently drive demand side management but DSM is otherwise ignored. Leaving DSM to price favours the rich, who have options, against the poor who do not.
- This will provoke accelerated grid defection by commerce and the middle classes as the cost advantage of small-scale dispersed 'embedded' renewables increases.
- Municipalities and poor people will then be left with an overpriced slum grid. Over 56% of people in South Africa are poor and many who have 'access' to electricity are cut off – either for unpaid bills or for want of money for pre-paid meters.
- The IRP does forecast an increase in embedded energy generation but effectively treats it as outside the national power system and hence as reducing demand from that system. It does not conceive a system that integrates small-scale dispersed generators and active producer-consumers – or 'prosumers'.
- And it does not conceive a system that integrates the poor majority of the country.

Supply

IRP 2018 specifies what new plant will be needed from now to 2030. It models requirements through to 2050 but argues that things are changing too fast for concrete planning beyond 2030. Regular IRP updates should modify these plans for the 2020s as well as extending the planning horizon.

Figure 1 shows the IRP's 'recommended plan' [41] with: existing capacity in 2018; the completion dates for new plant that is already 'committed'; completion dates for new plant beyond that; and 'embedded' generation installed for own use at businesses or homes. It does not give annual figures for carbon emissions, water use, total capacity, the share of production for each technology, projected peak demand, reserve margins or DSM savings.



	Coal	Nuclear	Hydro	Storage (Pumped)	PV	Wind	CSP	Gas/ Diesel	Other (CoGen, Biomass, Landfill)	Embedded Generation
2018	39 126	1 860	2 196	2 912	1 474	1 980	300	2 820	499	Unknown
2019	2 155					244	300			200
2020	1 433				114	300				200
2021	1 433				300	818				200
2022	711				400					200
2023	500									200
2024	500									200
2025					670	200				200
2026					1 000	1 500		2 250		200
2027					1 000	1 600		1 200		200
2028					1 000	1 600		1 800		200
2029					1 000	1 600		2 850		200
2030			2 500		1 000	1 600				200
Total Installed	33 847	1 8601	4 696	2 912	7 958	11 442	600	11 930	499	2 600
ICM* %	44.6	2.5	6.2	3.8	10.5	15.1	0.9	15.7	0.7	

Installed Capacity	Committed / Already Contracted Capacity	New Additional Capacity	Embedded Generation Capacity (Generation for own use allocation)
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Figure 1: IRP Proposed Updated Plan for the Period Ending 2030

*ICM = Installed Capacity Mix

Coal-fired power starts with 39 126 MW. The ‘committed’ plants are the remaining eight units (5 732 MW) of Medupi and Kusile with three due for commissioning in 2019. In fact, two of these units are already producing but Eskom seems to be delaying formal commissioning. The new plants are the two BLIPPs – Thabametsi (630 MW) and Khanyisa (300 MW) – that made it through the DoE’s bidding round.



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Electricity from Medupi and Kusile will be exorbitantly expensive, as noted above, at R1.70 and R1.91/kWh respectively. Steyn et al [2017] show that Eskom could save R4 billion by not completing the last two units of Kusile. The remaining units at these plants would not make it into a 'least cost' IRP. In this plan, however, they are counted as already committed.

These plants have a 60-year life span, taking them to 2080. But they will be abandoned long before then either because running coal plants will become unacceptable or because the heat, droughts and floods brought on by climate change will make it physically impossible to run them.

Power from Thabametsi and Khanyisa was bid at R1.03/kWh. This compares with R0.62/kWh bid for both wind and solar in the latest renewable energy round. Because production by wind and solar technologies is variable, they need extra back up. Taking this into account, the Energy Research Centre (ERC) shows that these two plants will displace renewable energy at an additional cost to the energy system of around R20 billion and additional emissions of 170 Mt CO₂ over their 30-year life span [Ireland & Burton 2018]. These plants therefore had to be 'forced' into the IRP's 'recommended plan' because they are too costly to make it into a 'least cost' plan. As with the Eskom plants, they will likely be stranded well before their 30 years is up.

A least cost IRP now would be all renewables plus back up – either storage or gas. The committed plants are from the latest bidding round and will likely be completed well ahead of 2022. The gap before the next plants are built in 2025 is created by the two BLIPPs. In addition, the IRP unnecessarily restricts how much renewable energy can be built every year and it is still using inflated costs estimates. At R0.62/kWh, it is already below Eskom's cost of production (63c/kWh excluding depreciation and debt) but prices are still falling rapidly around the world. As Grové Steyn points out, a kWh of renewable electricity will soon cost less than just the coal needed to produce a kWh.¹⁴⁴

144 Grové Steyn, *Energy plan's drafters are stuck in a coal hole and have just kept digging*, Business Day, 3 September 2018.



The IRP assumes that gas or diesel ‘peaking’ power plants will be needed to compliment renewables. There are two problems here. First, the IRP is over-compensating for variable renewable production and building more flexible plant than necessary. Second, gas may be cleaner than coal but it is still dirty energy. It must either be imported or come from a source discovered and developed in South Africa. Sasol already has a gas pipeline, constructed with government subsidies, from Mozambique and stands to benefit handsomely from an expansion of gas. The next options for gas include fracking shale in the Karoo or fracking coal in places where it cannot be mined. It is doubtful that there is much gas to be had. Be that as it may, these options are excessively polluting of water and very prone to leaking gas at the well heads.¹⁴⁵ Government has also parcelled out concessions for offshore oil and gas exploration all around the coast. Big oil corporations, including ExxonMobil, Sasol and ENI, have already run several seismic campaigns. As the military metaphor implies, these campaigns amount to an all out assault on marine life.

All extracted gas is methane. At the power station, it burns cleaner than coal and produces less than half the carbon emissions. But leaks from well heads, pipelines and storage tanks will eliminate the advantage. Particularly high concentrations of methane have been measured over the fracking fields of the USA.¹⁴⁶ Methane is a very potent greenhouse gas. Over a 20-year time horizon, each tonne is equivalent to around 86 tonnes of CO₂. It is also a toxic gas at ground level.

145 Scholes, R., Lochner, P., Schreiner, G., Snyman-Van der Walt, L. and de Jager, M. (eds.). 2016. *Shale Gas Development in the Central Karoo: A Scientific Assessment of the Opportunities and Risks*. CSIR

146 Christian Frankenberg, Andrew Thorpe, David Thompson, Glynn Hulley, Eric Kort, Nick Vance, Jakob Borchardt, Thomas Krings, Konstantin Gerilowski, Colm Sweeney, Stephen Conley, Brian D. Bue, Andrew Aubrey, Simon Hook, and Robert Green, 2017, *Airborne methane remote measurements reveal heavytail flux distribution in Four Corners region*, PNAS; and Lena Höglund-Isaksson, 2017, *Bottom-up simulations of methane and ethane emissions from global oil and gas systems 1980 to 2012*, IOPscience, doi:10.1088/1748-9326/aa583e



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The BLIPPs

The shrunken prospects for Boom 3 now rest with the mines and ‘Baseload Independent Power Producers’. Half the material from the coal seams is discarded, some 30-40% is low grade thermal coal with a high ash content and just 10% is a ‘soft’ coking coal.¹⁴⁷ The mines need the BLIPPs to burn the low grade thermal coal to make them economically viable. They then need to wash the soft coking coal to produce a ‘blend’ coke good enough to mix with better quality coke for use in metal smelting. This can be exported at a profit, provided there is rail capacity to take it at low cost. Large quantities of water are also needed, both for the power stations and the coal washeries, and this must be piped in if they are to be viable.

The DoE’s BLIPP programme was modelled on the renewable energy IPP programme which was widely regarded as a success. The REIPP itself was more about a response to the power supply crisis “than a genuine commitment to RE” [Overy 2018: 5]. This nevertheless reflects a particular strength of renewables. The REIPP projects went up in under two years and made a substantial contribution to ameliorating the effects of Eskom’s rolling mass load shedding.

Following the REIPP with the BLIPP demonstrated the priority of the IPP office, which sits within the DoE but is staffed with technocrats seconded from Treasury, for privatisation over climate or environment. The minister issued a ‘determination’ calling for 2 500 MW of coal in December 2012 and the IPP office issued a request for proposals two years later in December 2014. In the meantime, private energy corporations were already busy with project preparation and several had initiated environmental impact assessments (EIAs).

In all, fourteen projects have been proposed, most of them in the range of 300 to 1 200 MW, and most taking the cheap option for FBC boilers. All are claimed to be needed to relieve the power shortage that was relieved three years ago already. They will take around five years to build so, if they were to start construction in 2019, they will be eight years too late to save the day.

¹⁴⁷ Claris Dreyer, interview 9 April 2018.



Of the 14 BLIPPs that have been proposed, eight are in the Waterberg and these eight are all linked to proposed new mines. To be viable, the power stations need the mines and the mines need the power stations to burn the low quality middlings. In addition, the mines need water and a sophisticated washery to wash the 'blend' coke to produce a saleable product and they need a railway line to get the coke to Richards Bay. The proponents for all the power plants and most of the mines are transnational corporations. Several of them appear to have abandoned the projects although they avoid saying so and simply go quiet. Only two projects made it to the status of 'preferred bidder' in the DoE's first BLIPP bid window – Thabametsi in the Waterberg and Khanyisa on the Highveld – and both are subject to legal challenge.

Anglo & Vedanta

In 2013, Indian TNC Vedanta proposed a 600 MW FBC power plant to the west of Steenbokpan near the Limpopo River that marks the border with Botswana. It was to supply power either to the South African grid or to Vedanta's own operations in southern Africa: Scorpion Zinc in Namibia and Konkola Copper Mining in Zambia. Konkola has cemented Vedanta's reputation as an abusive corporation. It is owned by Indian billionaire Anil Agarwal who "bought Konkola for just \$25 million in 2004 and a decade later bragged that he had taken home between \$500 million and \$1 billion a year from Konkola". In short, he proudly cheated the Zambian government who sold it to him. Zambian people are now protesting that the mine's toxic waste has poisoned 1 826 local farms.¹⁴⁸

The project was paired with Anglo American's proposed Dalyshope mine which was to supply it with four million tonnes of coal a year. The coal is of such low quality coal that Eskom would not take it. It is more than 50% ash, so the power plant would burn about 12 500 tonnes of coal and produce 6 800 tonnes of ash a day. Over the 40-year life of the plant, that would add up to a very large 100 million tonne heap of ash.

¹⁴⁸ Patrick Bond, *Activists go for weakened mining: An international forum draws strength from worldwide protests against extraction*, Mail & Guardian, 16 November 2018.



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Carbon dioxide emissions would be around 8.5 Mt/y or 340 Mt over the 40 years. The high sulphur content of Waterberg coal would be mitigated by injecting crushed limestone into the furnace. The limestone absorbs sulphur and falls out as gypsum mixed in with the bottom ash. Every day, 700 tonnes of limestone would have to be trucked in. Vedanta claimed that this would remove around 90% of sulphur from the flue gas. That, however, would depend on Vedanta not economising on limestone. The proposal included a bag house to capture particulates which would also be of variable efficiency according to how the plant was operated. It would consume about 600 million litres of water a year although a reliable source was not evident.

In common with other Waterberg projects, the scoping report for the power station was presented as if it were independent of the mine. It nevertheless argued the environmental benefits of burning low quality coal and so reducing “the volume of discard to be dumped”.¹⁴⁹ Earthlife pointed out that the projects were mutually dependent.¹⁵⁰ Anglo’s mine was justified as supplying Vedanta’s power station while coal exports were referred to in vague terms. Nothing was said of the coal washery and water requirements needed for export coal – even if, as seems likely, Anglo planned to mine export coal once the power station had created a market for the middlings. In short, without the power station, there would be no mine and no discard to dump. This is the pattern for all the combination mine and BLIPP projects.

Temo and Namane

Next door to Anglo/Vedanta, is the proposed Temo coal mine and 600 MW Namane IPP. Temo was initially planned to supply Eskom with five million tonnes of coal a year, with another two million soft coke for export. The Namane power station was subsequently proposed as the quality of the thermal coal was too poor for Eskom. It might be added that there was and is no prospect of Temo, or any other Waterberg mine, competing with Grootegeluk on cost to supply Eskom. As noted above, Grootegeluk has the best spot on the coal field,

¹⁴⁹ Digby Wells Environmental, *Scoping Report for the proposed Vedanta Power Plant*, June 2013, p.26.

¹⁵⁰ Earthlife Africa Jhb Comments on: *Proposed Dalyshope Phase 1 Coal Mine, Draft Scoping Report*, 19 August 2013; and *Draft Scoping Report for the proposed Vedanta Power Plant*, 19 August 2013.



the infrastructure is paid off, the mine is very efficient and large scale and the middlings go to Eskom down a short conveyor belt. It has also contracted with Transnet to use more or less the full capacity of the coal line to get its blend coke to market.

Namane Resources is given as the applicant for environmental authorisations in project documents, first for the Temo mine and subsequently for Namane IPP. It is described as an “associated company” of Community Investment Holdings (CIH), a “black owned and women led” company with interests in “healthcare, ICT, power & energy, logistics, mining and infrastructure”.¹⁵¹ The CIH website lists Temo Coal as a premium asset. CIH is also invested in Anker Coal and Golfview Mining, notorious for the abandoned mine outside Ermelo featured in the groundWork Report 2016. Namane is shown as a commodity trader marketing to Eskom and for export through Richards Bay. The IPP project did not make it into the first BLIPP round and does not feature on the CIH site. The prospect for a revival of these twinned projects is remote, but the company is hanging onto the properties, mining rights and authorisations and is undertaking environmental impact assessments for a water pipeline from Lephalale’s sewage plant and a railway connection to the line that Resgen’s Boikarabelo is yet to build.

Resgen’s Boikarabelo

West of Temo, about 80 km from Lephalale, is Resgen’s Boikarabela mine. Alongside the road to the mine, two new bridges stand isolated in the bushveld like monuments to futility. They were built some five years ago to carry a railway line from Lephalale to Boikarabelo, but the rail has not been built. Since 2013, Resgen has repeatedly claimed that it is about to close deals for debt finance to build the mine. Now, in 2018, its latest statement says it is talking to a secret funder to secure finance. It wants the deal done by Christmas 2018.

151 <http://www.ciholdings.co.za/> at 17 September 2018; and Digby Wells Environmental, *Draft Scoping Report for the Proposed Temo Project*, October 2013; and *Draft Scoping Report, Namane Generation Independent Power Plant*, November 2015.



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Resgen is an Australian corporation with just one asset – the part of the bushveld which they have yet to develop as the Boikarabelo mine – no income and mounting losses. To manage this asset, Resgen has an elaborate corporate structure. Resource Generation Ltd has two subsidiaries: Resgen Mauritius and Resgen Africa. Resgen Mauritius owns Resgen South Africa which in turn owns 74% of Waterberg One Coal Ltd. Resgen Africa owns 74% of Ledjadja Coal. The remaining 26% in both Ledjadja and Waterberg One is held by Resgen’s BEE partner, Fairy Wing Trading 136, reportedly linked to former DMR officials.¹⁵² Ledjadja owns Boikarabelo with a mining right while Waterberg One merely holds some prospecting rights. Resgen Mauritius appears to have no real function unless it’s to make use of the offshore tax haven.

According to Resgen’s annual reports, investors hold 580 million shares. The biggest shareholder is South Africa’s Public Investment Corporation (PIC) with 113 million shares, followed by Noble Group with 80 million shares. Noble is a minor Australian commodity trader which managed losses of US\$200 million in the second quarter of 2018, an improvement on losses of \$1.8 billion in 2017. Resgen’s share price slumped from A\$0.30 in 2013 to A\$0.05 in 2018 (in Australian dollars). So the PIC has lost A\$28 million – about R290 million – on behalf of the Government Employee Pension Fund. Meanwhile, according to Resgen, the IDC approved a R540 million loan in April this year subject to various conditions. The IDC itself lists an amount of R1 billion – which leaves a R460 million question hanging. In 2017, the DBSA promised funding for the rail link although this appears to have lapsed as Resgen is once more “in talks” with possible funders. It is a condition of the IDC loan that funding for the rail must be secured.

These public sector loans and investments appear to be nested in conflicts of interest. The IDC has listed the ‘prominent influential persons’ who are beneficiaries of the deal. They include: Jabu Mabuza who was appointed Chair of Eskom’s board in January 2018; two people from the Land Bank’s board where Eskom CEO Phakamani Hadebe is a former CEO; one person from the board of the DBSA; nine members of the PIC board – all but two of

¹⁵² City Press, *Waterberg windfall for black mining firms*, 16 December 2012.



the 11-person board – including CEO Dan Matjila and Chief Finance Officer Matshepo More; and former deputy finance minister, and hence former PIC board chair, Sifiso Buthelezi.

Boikarabelo has zero chance of success, according to retired Grootegeluk manager Joe Meyer.¹⁵³ By comparison with Grootegeluk, it has a thick overburden and is missing the high value Bench Two coal. It was intended primarily as an export coal mine but they have not done a proper study on transport costs. They would have to build the infrastructure from scratch, including the railway line to connect to the main coal line from Grootegeluk. They would need an elaborate coal washery but are increasingly unlikely to get the water for it. And, he concludes, there is no market for the middlings.

Resgen, however, hopes to sell the middlings to Eskom and says that a test burn was successful. By July 2017, Eskom had not given a formal undertaking to take the coal and, if the new Eskom management were to agree to it, the deal would surely be tainted given Mabuza's position. Moreover, the coal would either need to cost much more than Grootegeluk coal or be sold at a loss. Since Matimba and Medupi are fully supplied, it would presumably be railed to the Highveld, adding substantially to Eskom's already escalating coal costs. Resgen is looking for a sweet deal from Transnet but the latter would need to expand the capacity of the Waterberg coal line and recover the costs of doing so – unless, of course, a more or less hidden subsidy is arranged.

As an alternative, Resgen's 2017 annual report said it would enter the bidding to build an independent power producer (IPP) "in response to the anticipated request for proposal from the Department of Energy during 2018". That prospect too has turned to dust as the draft IRP 2018 confirms that there will be no such request for proposals. Their latest annual report goes silent on what it will do with the coal but merely asserts that South Africa remains dependent on burning it.

The company nevertheless boasts "a genuine public-private partnership with critical stakeholders in the South African public sector including Transnet, the Public Investment Corporation (PIC), the Industrial Development Corporation

¹⁵³ Interview, 13 September 2018.



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(IDC) and the Development Bank of South Africa (DBSA) ... Without the support of these public sector institutions, it is reasonable to suggest that the project may well have been stillborn.”¹⁵⁴ Indeed. And it seems highly unlikely that they will get any return. Resgen executives have, however, done quite nicely. In 2017, the CEO got A\$800 000, a touch over R8 million a year. The top salary has been notched down in 2018 but total executive pay has increased a little to just over A\$2 million – or R21 million. With perks and ‘performance shares’ it comes to over R25 million.

Sekoko – crumbs of the Waterberg

Sekoko is sandwiched between Sasol and Exxaro’s Thabametsi mine. This might be thought to be a promising location, but Dreyer warns that there are many discontinuities in the coal field. Sekoko, he says, have the crumbs of the Waterberg and have not drilled enough cores to show a viable reserve.

Sekoko is the BEE joint venture partner with Firestone Energy, another one-trick pony from Australia, in what was then known as the Waterberg Coal project. In 2013, Firestone was taken over by Range River Gold which then changed its name to the Waterberg Coal Company (WCC). Firestone was then made the subsidiary of WCC. Like the subsidiary, the parent also appears to have had no real assets outside the Waterberg farms. Both companies were dual listed on the Sydney and Johannesburg stock exchanges.

As with Boikarabelo, WCC’s strategy was first based on selling coal to Eskom and it later added on an IPP, apparently in the hope that this would appeal to funders. In 2015, loaded up with massive debt, WCC enticed Sibanye Gold to consider taking an interest in the project. This deal fell through, in part because Sibanye considered that ownership of the project was too complicated. Firestone suspended trading in 2015 and WCC was delisted from the Sydney stock exchange for failing to pay the annual listing fee in 2016. What’s left, it seems, is the shell of a company with debt of some R225 million to a consortium of lenders including Standard Bank. Nevertheless, in 2017 Sekoko was again touting the project to funders in the hope of bringing it back from

¹⁵⁴ Ibid p.10.



the dead. This time it scaled down the initial ambition and capital spending, aiming to produce 600 000 tonnes a year for sale to Eskom's Waterberg power stations.¹⁵⁵ In 2018, it seems unlikely that Eskom would pay Sekoko enough to cover its costs when it will get coal cheaper from Exxaro.

Mines in town

Two mines have been proposed within the Lephalale town bounds. Jindal Mining, a local subsidiary of the Indian steel maker, wanted to develop a mine on Peerboom farm on the eastern edge of Marapong. At a meeting with municipal councillors in 2013, it claimed that the mine would create 800 jobs but, to the irritation of the council, refused to produce any documents or give details even of the mine's location. Jindal has one other coal mine in South Africa, the Kiepersol anthracite mine in the upper catchment of the Assegai River between Piet Retief and Wakkerstroom. Jindal Mining, however, has been making losses for three years and the parent company let it go bust and put it into business rescue in June 2018.¹⁵⁶ Some 300 jobs are at stake and, if the mine cannot be sold as a going concern, the prospects for a proper mine closure are doubtful. It seems unlikely that Jindal will develop the Peerboom mine in Lephalale but it is still marked on the latest IDP map. This does not, of course, mean that someone else won't take their place

The second town mine is Groothoek, next door to Peerboom. It is particularly controversial and opposed by Lephalale Municipality and Eskom as well as by Earthlife and Concerned Citizens of Lephalale. It is located directly between Marapong and Onverwacht and on the doorstep of these residential areas and the Lephalale hospital. Mine blasting would certainly damage people's houses as well as fill the air with dust. More dust would be kicked up by draglines and haul trucks. The mine straddles the Sandloop River and associated wetlands.

¹⁵⁵ David McKay, *WCC's Miller falls on sword amid fresh takeover attempt*, MiningMx, 10 March, 2016; Charlotte Mathews, *Coal: Get out when you can*, Financial Mail, 14 April 2016; David McKay, *Sekoko intends to resuscitate scaled down Waterberg project*, MiningMx, 9 June, 2017; and <http://www.delisted.com.au/company/the-waterberg-coal-company-limited>.

¹⁵⁶ Valerie Cilliers, *A coal mine on your stoep*, Bosveld Bulletin, 13 September 2013; Bloomberg, *Jindal Steel South Africa units file for business protection*, Mining Weekly, 26 June 2018; Jindal Mining SA (Pty) Limited, Business Rescue Proceedings, minutes of first creditors meeting, Tuesday, 26 June 2018.



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This is a small seasonal tributary of the Mokolo and critical to the local ecology in a very dry part of the country. The mine is planned as two open cast pits, 130 m deep, on either side of the Sandloop. Even if it does not divert the stream, it will simply remove a large part of its catchment. The municipality is particularly concerned that the mine will forestall the possibility of ever integrating Marapong and Onverwacht to make a more coherent town of Lephhalale.

Despite these objections, the DMR granted the Groothoek Coal Mining Company an environmental authorisation (EA) in April 2017. It included 'site specific conditions' which are vague enough to be meaningless. Earthlife and the Concerned Citizens immediately appealed against the decision to the minister for environmental affairs, as did the municipality and Eskom. In November, the minister did indeed set aside the decision but, it seems, on narrowly bureaucratic grounds. She said:¹⁵⁷

Having reviewed the grounds of appeal by the appellants, as well as the responses thereto by the applicants, I have taken particular note of comments by the DMR that it erred in the premature issuing of the EA. The DMR submits, furthermore, that some of the activities assessed and applied for by the applicant were omitted from the EA. Accordingly, the DMR has requested that I set aside the decision and remit it back for reconsideration.

Her decision said nothing whatever about the "grounds of appeal" and the DMR took no notice of them. It made no amendments to the site specific conditions but simply pasted in the missing activities and reissued the EA one month later. This decision has again been appealed and the outcome is yet to be decided.

Groothoek is a project of Umbono Capital, a private (unlisted) company based in Houston, Texas, and Johannesburg. In the US, its Riverside subsidiary fracks shale to produce gas. In South Africa, Groothoek appears to be Umbono's only asset. But it also has a 'strategic alliance' with Sunbird Energy, a joint venture

¹⁵⁷ Minister, Environmental Affairs, Appeal decision, 11 November 2018.



partner with PetroSA, the troubled state owned corporation, on the Ibhubesi gas project off the West Coast. According to Umbono, Sunbird also has coal bed methane projects in Botswana.¹⁵⁸ As yet, these ventures are doing nothing more than flare gas.

Lephalale Coal and Power

The Lephalale Coal and Power project is located on the flat lands about half way between the Mokolo and Lephalala Rivers, some 20 km east of Lephalale town. It is an initiative of the Masimong Group, which commissioned a prefeasibility study in late 2015. The study, completed in September 2016, found that a coal mine with a ‘captive’ power station would be viable. According to the consultants, “The Waterberg coalfield ... is viewed as a critical future source of thermal coal in South Africa which continues to face a national power deficit”.¹⁵⁹ By this time, however, the power ‘deficit’ had turned to surplus. In April 2017, an EIA process opened with a Background Information Document (BID) that confirmed that the mine would depend entirely on the twinned BLIPP while “other markets and optimisation options are being further investigated”.¹⁶⁰ In other words, there is no other market. Nevertheless, the EIA for the mine ignores the impacts of the power station which it says will be addressed in a separate application. Hence, the combined impacts of the project would not be addressed.

The project was already too late for the first BLIPP bid window but Masimong may have been encouraged by the IRP 2016 base case which included another 15 000 MW coal-fired power to be installed between 2028 and 2041. Given the withering criticism of the IRP, this would indicate more faith than judgement. The final environmental impact report, published in November 2017, still justifies the project in terms of load shedding but adds in a line about Eskom’s

158 <http://www.umbono.com> at 23 September 2018.

159 <https://www.royalhaskoningdhv.com/en-gb/south-africa/projects/lephalale-coal-a-power-pre-feasibility-study/6730> at 23 September 2018.

160 Lephalale Coal and Power Project, Background Information Document, Kongiwe Environmental Science and Engineering, 18 April 2017.



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ageing fleet. With the publication of the IRP 2018, this justification has crumbled.

Masimong are active in nine different sectors, from financial services to energy, chemicals and agriculture, reflecting an ‘investment philosophy’ that includes “opportunistic and nimble” deal making in whatever comes up. Masimong Energy has only this project in the Waterberg.¹⁶¹ The group is led by Mike Teke, the outgoing president of the Chamber of Mines, who is now also leading the much larger Seriti group, which is “co-owned by four black anchor shareholders, Masimong Group, Thebe Investments Corporation, Zungu Investments and Community Investment Holdings”.¹⁶² The last named is behind the Temo-Namane project. Seriti was put together for the purpose of buying the big Anglo mines that supply Eskom – Kriel, New Denmark and New Vaal – following Anglo’s decision to cut loose from Eskom and retain only the more lucrative export coal mines. The deal was eventually concluded in April 2017 for R2.3 billion. It was followed by a second deal for New Largo, the yet to be developed mine intended to supply Kusile with around 14 million tonnes of coal a year, sold for R850 million to Seriti, Coalzar and the Industrial Development Corporation (IDC). Developing the mine is estimated to cost around R20 billion, to be financed, it seems, largely by the IDC and debt. Seriti also wants to buy Optimum, the Gupta mine currently in business rescue, which would give it an export allocation at Richards Bay. The mine was previously owned by Optimum Coal Holdings, a company in which Teke had a major interest, before it was sold to Glencore and then to the Gupta’s Tegeta.¹⁶³

Anglo’s coal bed methane

Apart from Dalyshope, Anglo has vast land holdings on the wrong side of the Daarby fault where the coal is too deep to mine. They are said to be running most of it as a large game and hunting operation but, since there is little access

161 Masimong Group Holdings, Fact Sheet, February 2017.

162 <https://seritiza.com/corporate-governance> at 24 September 2018.

163 See, amongst others, Anine Kilian, *Anglo concludes R2.3bn sale of Eskom-tied mines to Seriti*, Mining Weekly, 1 March 2018; Anine Kilian, *Anglo to sell New Largo assets to Seriti, partners for R850m*, Mining Weekly, 29 January 2018; and David McKay, *Mike Teke plans to take Seriti Resources public within 24 months*, MiningMx, 14 September 2018.



to the area even for other hunting outfits, it is difficult to know. Somewhere in the middle of it, at Bulklip about half way between Lephalale and the Botswana border, is the Waterberg CBM Pilot Project.

Coal bed methane is a variation on fracking and it is used only where coal is unmineable. Contrary to industry claims that it is a 'clean coal technology', it is really no more than a way of expanding coal reserves. About three quarters of South Africa's coal resource is said to be unmineable. As we observed in the groundWork Report 2016, if all of it were extracted as gas, that would add between 80 and 160 Gt CO₂, depending on whose estimate of the conventional coal reserve one believes. And CBM is pretty dirty in other respects too:

CBM starts with 'dewatering' a 'gassy' coal seam to produce methane gas. This is frequently followed by fracking as the seam dries. Where water and methane saturate the coal seam, methane is bound – or adsorbed – to coal under pressure. Pumping out the water relieves the pressure and thus permits the flow of methane. This 'produced water' is generally contaminated with salts, metals and hydrocarbons such as benzene, toluene and ethylbenzene. When the flow of methane slows, the well is fracked: a mixture of water, toxic chemicals and sand is blasted down a well under high pressure to open fissures in the coal seam and so stimulate the flow of gas. Like produced water, the return water from this process comes to the surface. CBM wells are conventional vertical wells and pepper the landscape in close array. Since there is groundwater in the coal seam and in the rocks immediately above it, there is a strong probability of groundwater contamination [gW Report 2016: 179].

Anglo initiated a series of studies in the early 1990s and started acquiring farms and drilling five 'spot wells' at Bulklip in the middle 2000s. There do not appear to be any public reports on the success or otherwise of the test wells but Anglo apparently intended to expand the pilot and, according to Dowling,



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the Waterberg showed more promise than projects in Botswana where Anglo was also involved in CBM prospecting.¹⁶⁴

However that may be, Anglo appears to have canned its CBM projects in 2014 when commodity prices plunged and the corporation announced a new strategy to divest itself of all loss making projects and to get out of coal altogether. Three years later, prices recovered – although they remain volatile – and Anglo decided to keep its export coal mines and sell off only the Eskom tied mines. It has not said what it intends doing with the Waterberg project or, indeed, with the Waterberg farms. With nearly 12 000 MW of gas-fired power included in the first draft of the IRP 2018, Anglo may be tempted to enter an IPP bidding round or to develop a bid with the intention of selling it on – as it did with the Khanyisa BLIPP in Mpumalanga. In that case, the bushveld north of Lephalale will be littered with well pads and it can be anticipated that methane will leak liberally from a thousand well heads.

Thabametsi

Exxaro's planned Thabametsi mine is next door to Grootegeluk. The company envisages digging out another three or four million tonnes a year to add to the 25 Mt/y that it now takes out of Grootegeluk. This looks like a race to mine as much as possible as fast as possible. Reserves are well defined, according to Dreyer, and the new mine would be more or less as an extension of Grootegeluk and so would spend little on infrastructure.

Exxaro planned two power stations to twin with the Thabametsi mine: Tshivhaso and Thabametsi. Both were to be 1 200 MW FBC plants to be built in two phases. Tshivhaso was a project of Cennergi, Exxaro's energy partnership with Indian TNC Tata. It seems that this project has been dropped as there is no mention of it on the company website. Thabametsi's 630 MW Phase 1 plant is the frontrunner of the BLIPPs, being one of only two projects that made it through the DoE's first bid window for privatised coal-fired power stations. Nevertheless, the project is extremely controversial and its proponents are

164 G. Dowling, *CBM potential of RSA, Botswana & Zimbabwe*, FFF workshop presentation, 11 May 2016.



confronted with numerous court challenges before they can put a shovel to the ground.

Exxaro initiated the Thabametsi project in 2014 and looked for major energy corporations to provide the power station to partner the mine. The French TNC Engie, previously known as GDF Suez and notorious for profiteering from privatised water and energy around the world and particularly in the global South, fitted the bill and took the majority stake in the project. It was immediately confronted by protest both in South Africa and France.

Protests intensified as France prepared to host the annual climate negotiations (CoP 21) in 2015 both because the French government is a major shareholder in Engie and because Engie itself, along with other carbon heavy corporations, sponsored the event. The obvious hypocrisy started looking like a public relations disaster for both France and Engie as Earthlife Africa led marches on the French consulate in Johannesburg while Friends of the Earth France organised simultaneous protests outside the corporate headquarters in Paris. In October 2015, six weeks ahead of the climate conference, Engie announced that it would stop investing in coal.

Exxaro promptly lined up the Japanese Marubeni Corporation to step into Engie's shoes and Marubeni brought the Korea Electric Power Company along for the ride. Earthlife then led protests to the Japanese embassy in Pretoria and linked into a growing international campaign against Marubeni's dirty energy investments – expanding a fleet of coal power stations from 3 493 MW to 13 620 MW – with all but one of the planned plants in the global South. It was not only the energy that was dirty. In 2014, Marubeni admitted to the US Department of Justice that it had bribed Indonesian officials to get the contract to build the Tarahan coal power station. Two years before that, it paid a fine to hold off prosecution on bribery charges relating to the construction of a gas facility in Nigeria.¹⁶⁵

Nevertheless, the Japanese government actively promoted the coal binge by Marubeni, Mitsui and other energy corporations. As 'No Coal, Go Green!'

¹⁶⁵ Paul T. Friedman, Stacey Sprenkel and Tiffany Rowe, *Marubeni Gets Hit Again For FCPA Violations*, Morrison & Foerster LLP, 25 March 2014.



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a consortium of Japanese environmental organisations comment, “Often a whole package of technology export, public finance, insurance and export guarantees is offered to a country or a region. This way Marubeni brings in not only the technical expertise, but also the financing options and insurance for a project, with the support of JBIC (Japan Bank for International Cooperation) and NEXI (Nippon Export and Investment Insurance).”¹⁶⁶

Japan even tried to pass off some \$1.6 billion in loans for coal-fired stations in Indonesia, India and Bangladesh as climate finance. Following the latest propaganda of the World Coal Association, Japan claimed that it supported ‘High Efficiency, Low Emission’ (given the acronym HELE to make it look like something real) ‘clean coal’ power stations that saved on emissions when compared with ordinary old dirty coal power stations.¹⁶⁷ This naturally met with a storm of protest and derision. And the claim that the Japanese stations were in fact more efficient than others was shown to be false by the ‘no coal’ group.¹⁶⁸

Costly

Thabametsi is not just dirty, it is costly too. As noted above, coal was only ever cheap because mineworkers’ lives were cheap and the costs of pollution and the destruction of land and water resources were ignored. It is no longer cheap even in strict money terms. Eskom buys all the power produced by IPPs and then sells it on to customers. Nersa approves Eskom’s tariffs and allows a full ‘pass through’ of what Eskom pays for IPP power. In other words, the price of IPP power is included in what Eskom charges electricity users. In the DoE’s BLIPP process, Thabametsi’s bid came in at a price of R1.03 per kWh. That

166 No Coal, Go Green!, *WHY Marubeni? Why and how investors should divest from and/or exclude Marubeni*, Friends of the Earth Japan (FoE Japan), Japan Center for a Sustainable Environment and Society (JACSES), Kiko Network, June 2018.

167 Tim McDonnell, *Japan Wants You to Believe That These Coal Plants Will Help the Environment*, Mother Jones, 27 March 2015.

168 *Dirty Coal: Breaking the Myth About Japanese-Funded Coal Plants*, published by: Kiko Network, JACSES, Friends of the Earth Japan, CoalSwarm, Friends of the Earth US, Sierra Club. April 2015.



compares with renewable energy (wind and solar PV) bids of R0.65/kWh in the most recent REIPPPP energy bid window.¹⁶⁹

Compared with a ‘least cost’ option for future power generation, Thabametsi and Khanyisa – the other BLIPP accepted as a preferred bidder – would together add R20 billion to the total system costs over the life time of the plants, according to Ireland and Burton [2018]. Thabametsi accounts for the better part of that at R12.6 bn – an average of R420 million a year over the 30-year life of the plant. This would amount to a massive subsidy paid for by all electricity users.

High impact

Thabametsi is a ‘Low Efficiency, High Impact, Severe Pollution’ plant in the ‘no coal’ group’s sardonic headline.¹⁷⁰ According to the atmospheric impact report (AIR) it will emit: 15 000 tonnes SO₂ per year; 14 000 t/y NO_x; 51 000 t/y carbon monoxide and 35 t/y PM₁₀. However, according to Ranajit Sahu, the AIR is deeply flawed and “designed to under-predict impacts”.¹⁷¹ Amongst other things, it uses low pollutant emission rates, particularly for SO₂, and low coal usage rates. The implication is that SO₂ emissions could be double that given in the AIR. And that assumes that the plant operators are not stinting on the limestone injected into the furnace.

As with other projects, the impact assessments treat the mine and power station as separate entities. In Sahu’s view, emissions of fine particulates (PM_{2.5}) in the air quality assessment for the mine itself “are underestimated by at least five times”.¹⁷² The power station AIR does consider cumulative emissions but only from the tall stack emissions of the three power stations: Thabametsi, Medupi and Matimba. It argues that the impacts of dust (PM) from low level sources – such as ash dumps, coal and limestone stockpiles,

169 At 2016 Rand. Renewable bid window 4 ‘expedited’ produced average bids of 62c/kWh in 2015. We’ve adjusted for inflation to make the comparison with the coal BLIPPs which were bid in 2016.

170 No Coal, Go Green!, *WHY Marubeni? Fact Sheet 3: Thabametsi Coal Power Station, South Africa*. Life After Coal Campaign, 350 Africa, JACSES, Kiko Network. June 2018.

171 Ranajit Sahu, *Comments on the Atmospheric Impact Report (AIR) for the Thabametsi Power Plant*, 2018, p.13.

172 Ranajit Sahu, *Report on Thabametsi Mine and Power Plant Modelling*, March 2018, p.11.



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conveyor belts, trucks, draglines and mine blasting – are localised and mostly confined to the property. Sahu notes that this results in an underestimate of particulate emissions.

Spontaneous combustion from discard dumps and stockpiles is not discussed in any of the documents. Local people, however, particularly from the farms to the west, frequently note the hot smell of sulphur in the air, either from down drafting from the tall stacks or from burning discard coal heaps. Thabametsi mine and power station would add to both sources.

Both mine and power station would consume large quantities of water. Meyer argues that Exxaro's water saving and recycling at Grootegeluk are so impressive that there is enough for Thabametsi and all six Medupi FGD units and no need for MCWAP phase 2. It may be anticipated that a severe drought will test this claim. The 630 MW Phase 1 power station will consume 720 000 m³ a year, the water being taken from Exxaro's existing allocation of 7.6 million m³/y from the Mokolo Dam. In our view, however, the water of the Mokolo is already over-allocated to the neglect of the environmental reserve and Exxaro's allocation seems overly generous. Responding to Earthlife's concerns that other water users will be affected, Thabametsi's consultants concede that "the Mokolo Dam appears to be fully allocated and is currently operating at high risk" but argued that the completion of MCWAP Phase 2 would address this concern.¹⁷³

Thabametsi's FBC will produce ash, laced with heavy metals, on a prodigious scale because it will burn low grade high ash coal. Over the 40-year life of the power station, the ash dump will take over 200 million tonnes. While ash is likely to blow off the dump in dry weather, particularly if there is not enough water to damp it, flooding rain brings the risk of the dump being eroded and ash overflowing onto the land. The project plan puts the dump astride two geological faults and next to seasonal wetlands. The dump will have a liner but it is sub-standard and the water monitoring programme is also inadequate, according to water expert Evan Hansen.

173 Quoted by CER, *Supplementary objections to the water use licence application and integrated water and waste water management plan for the proposed Thabametsi independent power producer coal-fired power station*, 5 March 2018, p.13.



Consequently, it risks contamination of groundwater, wetlands and surface water and “may threaten human health and the environment for decades or longer”.¹⁷⁴ Moreover, these risks persist for ever.

Thabametsi’s ‘low efficiency, high impact’ is most pronounced in respect of climate change. The power station will produce greenhouse gas at the rate of 1.23 kilograms CO₂e for every kWh produced. That compares with Eskom’s fleet average of 1.05 kg/kWh and puts it on a par with the five oldest and least efficient plants, according to a climate change impact assessment (CCIA) of the plant. The high emissions intensity results from high nitrous oxide (N₂O) emissions produced by FBC plants in addition to CO₂. N₂O is a very potent greenhouse house gas, with each tonne having 300 times the global warming potential of a tonne of CO₂, and it also depletes the ozone layer. The 630 MW Phase 1 plant will emit 5.3 Mt CO₂e each year and 212 Mt over its 40-year planned life. The CCIA judged its emissions as ‘very large’ and its climate impact as ‘high’. A peer review of the CCIA argues that the impact should be rated as “VERY HIGH (NEGATIVE) due to high probability and very large emissions, and with limited opportunities for mitigation” [their emphasis].¹⁷⁵

The CCIA also found that climate change would impact on the plant as there was a ‘high’ risk that extended drought would result in a shortage of water. It is not clear if there will be less rain overall, but it is clear that the rain will come less often but in heavier downfalls. In other words, we can expect more droughts and floods. A hotter world will also result in higher levels of evaporation and reduced stream flow in both the Mokolo and the Crocodile, irrespective of whether there is a decline in rainfall, according to Brad Udall of the Colorado Water Institute.¹⁷⁶

Given ‘very high’ emissions risks and ‘high’ water scarcity risks, the peer review questions the CCIA’s finding that the overall impact of the project is ‘medium’ to ‘low’. In our view, the under-statement of risk and costs and the

174 Evan Hansen, *Potential risks to water resources from the proposed Thabametsi Power Station*. March 2018, p.3.

175 EOH Coastal & Environmental Services, *Peer Review of the Climate Change Study for the Proposed Thabametsi Coal Fired Power Station*, December 2017, p.4. The Thabametsi *Climate Change Study and Palaeontological Impact Assessment* is by Savannah Environmental, June 2017.

176 Brad Udall, *21st Century Climate Change Impacts on Mokolo and Crocodile (West) River Flows*, 26 February 2018.



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over-statement of benefits is a common characteristic of EIAs on the Waterberg and elsewhere.

Climate in court

Thabametsi was first awarded an environmental authorisation (EA) by the DEA in February 2015. Earthlife appealed to the minister against the award, arguing that the EIA was deficient in many respects, including that it gave no assessment of climate impacts. The minister agreed that a CCIA was required but nevertheless upheld the EA and made the assessment of the climate impacts a condition of the EA.

CER, on behalf of Earthlife, argued that the purpose of an assessment was to inform the decision on whether or not to grant an EA and could not therefore be made a condition of an EA that had already been granted. The court agreed, set aside the minister's appeal decision and ordered that the CCIA, together with comment from interested and affected parties, must inform a new decision. It confirmed that environmental authorisations must consider climate impacts. This is particularly significant since it seems that the DEA would prefer to avoid it and none of the other BLIPP EIAs give it more than a passing mention. The judgement also noted that the plant's high water consumption was likely to aggravate the impact of climate change and the high risk of water scarcity would affect the plant itself and the local community.

Despite finding that the environmental and social costs of the project are 'high', the CCIA peer review concluded that "this does not necessarily represent a 'fatal flaw' provided that the benefits are justified and can be motivated".¹⁷⁷ In January 2018, the minister issued a new decision which noted the CCIA and quoted this conclusion from the peer review. She again upheld the EA and justified the decision on the grounds that the IRP 2010, "having carefully balanced all relevant factors (including the threat of climate change)", permits new coal fired plants.

177 EOH, p.12.



Earthlife responded with disbelief that any decision made in 2018 could be based on the IRP 2010, a dated document that has aged badly because it was badly flawed in the first place and did not balance all relevant factors, least of all the threat of climate change. Together with groundWork, Earthlife is therefore returning to the court to challenge the minister's second decision to uphold the EA. In essence, they will argue that the environmental authorities are not bound to grant this particular plant an EA just because coal fired power is allowed in the IRP 2010 and the minister therefore needs better reasons for her decision.

Table turns?

Ironically, in market terms, Engie did well to switch its focus from fossils to renewables. In 2015, it opened a new coal-fired plant in the Netherlands and lost heavily. It has since developed a strong portfolio of renewable projects and won support from investors. On the other hand, as Buckley and Nicholas show [2018], Marubeni's commitment to coal acted as a drag on the company.

In April 2018, two Japanese insurance companies said they would no longer insure new coal-fired power projects. These are the first major Japanese financial institutions to start divesting from coal, but others will surely follow as the risk of being saddled with stranded assets looks ever more likely. Marubeni itself now sees the writing on the wall. In September 2018, it issued a statement saying that it "recognises that climate change is ... a problem that threatens the co-existence of the global environment and society, a problem that has an enormous effect on Marubeni's business and its shareholders, and a problem that Marubeni believes must be dealt with swiftly".¹⁷⁸

The first problem, in less evasive language, is human extinction. This is a dramatic recognition and does indeed merit swift action. Marubeni promises three measures: 1. It will cut its coal-fired capacity by half by 2030; 2. It will not enter into any new coal-fired power projects. But then again, it "might consider pursuing projects that adopt" best available technology (BAT) –

¹⁷⁸ Marubeni, *Notification Regarding Business Policies Pertaining to Sustainability (In Relation to Coal-Fired Power Generation Business and Renewable Energy Generation Business)*, 18 September 2018.



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meaning ultra-supercritical steam plants. 3. Within its generation business, it will double the share of power produced from renewables from 10% to 20% by 2023. But it does not actively close down any coal plants – it just waits for existing contracts to expire.

This may seem swift to a coal company but looks tardy in the context of climate change – particularly since Marubeni is so late off the mark. And the commitment to avoid new coal projects is disavowed as soon as it is made. Moreover, the exceptions go beyond BAT to include projects which the corporation counts as already committed. That apparently includes the dirty, costly and unnecessary Thabametsi.¹⁷⁹

In response, organisations from Japan and all countries under Marubeni's footprint told the corporation to get real. They demanded: full disclosure of Marubeni's power interests and coal exit plans; early closure of existing coal plants; a halt to construction on new plants; and cancellation of plants in planning.¹⁸⁰

Boom 3 costs before it starts

The mining companies have already bought out 57 farms, as noted above. The local farmers say this has disrupted the wildlife and hunting economy even before any mines are dug. Danie Steenkamp's farm is on the banks the Limpopo River, a prime location except for the fact that it is surrounded by prospective mines. Boikarabelo is just to the south and Temo and Anglo's Dalyshope are to the west. His farm is not of interest for mining but he is an irritant because he asks questions about environmental damage, particularly to groundwater. One of the mine managers told him they would surround his farm and wait till he was ready to sell it cheap.

Previously, the hunting farms cooperated so that they could take hunters to different locations. "Now I must travel a long way to take them to another

¹⁷⁹ Terence Creamer, *Marubeni says Thabametsi unaffected by group's policy to halve coal capacity by 2030*, 27 September 2018.

¹⁸⁰ Open Letter to Marubeni Corporation: Fix your loophole-filled new decarbonization policies. 12 December 2018.



hunting farm.” Boikarabelo bought about 10 farms for its mine, he says, but are doing nothing with them, not even veld fire management. They built a canteen and accommodation but now there is nobody there and the farms are emptied out. They bought more farms along the route of the yet to be built railway and are renting some of them back to the previous owners. But there is no investment on those farms. When a mining company buys the land, he says, the farm workers and their families have to leave. They go to Leseding, a shack settlement of some 200 or 300 households at Steenbokpan created as a result of this process.

Living in Leseding

The people of Leseding are angry. Most of them come from the farms of Steenbokpan. This is part of a broader process of farm dwellers moving or being moved off farms in South Africa. But this process is uneven from place to place and always locally specific. On Steenbokpan, a complex local dynamic is reflected in the variety of reasons that people gave for moving.

Many people had to move because coal mine corporations have bought the farm. While the farmers feel that the mines are driving them out, the farm worker families think they do well out of it. “The farmers are greedy so they sell out to the mines,” says Letta Sekoboane.¹⁸¹ In other cases, farmers evicted the members of extended families living on the farm and allowed only the immediate families of farm workers to remain. Elana Greyling says farmers were increasingly nervous about farm dweller rights, especially after the Extension of Security of Tenure Act (ESTA) was passed in 1997. In some cases, workers left the farms to look for better paid work at Medupi. Or, like Sekoboane’s father, farm workers fought with the farmer and either left or were fired.

The relationship between farmer and farm worker families, and particularly between the patriarchs on either side, often goes back three generations, says Greyling, so such breaks are often accompanied by a sense of betrayal on one or both sides. Ultimately, however, it is the farm workers and their families who

¹⁸¹ Letta Sekoboane, interview 14th April 2018.



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must give way. And they mostly leave or are left with nothing. Hosea Magoai is retired and lives on a piece of land on a farm that was bought by Ferroland, Exxaro's property company. "After 40 years," he says, "the farmer left without giving us a penny. There is no pension."¹⁸²

The Leseding settlement formed in around 2007 on government ground around what was previously an old age home for whites. People say that Jack Maeko, who is now the mayor of Lephalale but was then chairperson of the ANC Youth League of Waterberg region, came to the farms and "told us that this is our place now – we will not be moved from here. He said he had a title deed for us." At that time, they saw him as a freedom fighter, fighting for the people. They thought he would build them a full township with proper houses, amenities and roads with street lights.

Now they think that he was only fighting for his own political advancement. As mayor, he tells them they must move because the mines are coming. This has been discussed in a council meeting and at provincial level, but they do not hear what the people say. "They want to relocate us to Altoostyd, where we will live in shacks until RDP houses are built." And they would be squeezed onto smaller plots. People say they have a right to say 'no'. "We have graves here." Meanwhile, because the council refuses to declare Leseding a township, people are forced to live in tin shacks. Some families did build brick homes but the council demolished them because it will not allow permanent structures. But it has no money to build them proper houses in Altoostyd.¹⁸³

In Leseding, the municipality supplies water from an elevated tank which feeds stand pipes on the streets. It is supposed to be filled from a bore hole but, in the last several years, the bore hole has periodically run dry, according to local people, either because of drought or because Sasol's sample pit is draining the aquifer. The municipality now claims to send a water truck to refill the tank, "but we don't see it". Electricity is supplied through pre-paid metres but, unaccountably, no-one gets free basic electricity.

182 Hosea Magoai, interview 12th September 2018.

183 Leseding group interview, 12th September 2018.



The politics of work

“There is no work,” says Daniel Letsebe. “This place is full of hungry people. Rent and food go up. People have to buy firewood. They have to pay for a place to bury their dead. Everything costs money. But where must people get it from? The mines promise jobs for the people of Steenbokpan. The mayor promises jobs but he brings his own people from outside.”¹⁸⁴

Only a handful of people from Leseding got work on the Medupi construction and some people have had temporary work as general labourers for Sasol, Babcocks and Boikarabelo. Sasol arrived in 2010 to dig out the pit for the test burn sample. Babcocks followed. It is constructing the high tension power line to take Medupi’s power to the national grid and made a base at Steenbokpan for two or three years. It has now moved further down the line. In both cases, the corporates brought most of their own workers with them. Some of those workers rented accommodation in Leseding and so brought some money into the community before moving on. At Boikarabelo, people say, some 300 people were employed, of whom about 50 came from Leseding, to build the canteen and accommodation. They were employed on contract for two years.

If the mines come, they will not employ the local people except in menial positions. On the farms, the men learnt many things including how to handle and maintain big machinery. But it does not matter if you can do the job, the mines and construction companies want certificates. “Employers always ask for your papers. They want a Grade 12 and a diploma.” Few of the people in Steenbokpan went to school and some farmers were hostile: “If you could speak English, they would throw you in jail.” School is still difficult for the children. There is a local primary school but the nearest secondary school is in Marapong, so the older children have to get up very early and spend nearly an hour each way on the bus.

Politics is largely about exclusion. You have to be a member of the ANC to get a job with the big corporations – particularly Eskom, Transnet and Sasol. “We see the people at the hall every so often. They say the mayor is here. They say it is only for ANC, not the community.” Sekoboane says they only talk about

¹⁸⁴ Leseding group interview, 12th September 2018.



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work in these meetings but they don't bother explaining what the work is for. Ditiro Majapholo is chair of the Steenbokpan Community Forum. He used to be an ANC Youth League member and got a job at Transnet. But he saw that the recruitment process was rigged so he resigned from the League and from Transnet. "I got the job because they saw I was a troublemaker. They wanted to silence a critical voice."

The local ward councillor, on the other hand, is with the Democratic Alliance. He represents the interests of big business and is seldom seen in Steenbokpan. When he does hold a meeting, it is only for white people. He is not there for the people of Leseding.

Now, it seems, the last jobs are with the extended public works programme (EPWP), fixing the road that Sasol destroyed with its convoy of trucks. In April 2018, Sekoboane was filling in potholes and cutting the grass verge. She was employed for ten months only and for 12 days a month at R140 a day. About 30 people were employed in all but only seven from Steenbokpan. In the second half of the year, the work was expanded to reconstruct parts of the road. People say the mayor arrived with a busload of his own people and then presided over a bizarre jobs lottery. People had to put their IDs in a box which was shaken up and those whose IDs were picked got the chance to work on the road. "They took 20 of us and brought another 20 from outside."

The meeting broke up in chaos. There was a fight between the locals and the mayor's supporters. "The police took nine of our people from the meeting and put them in jail." The case went to court where it was dismissed for lack of evidence. "We blame Mayor Jack for taking over the recruitment process and not doing it properly." People who got work do not know what the conditions are or even how much they are supposed to be paid. And the EPWP does not have a safety officer.¹⁸⁵

185 Leseding group interview, 12th September 2018.



For all that life is harsh in Leseding, people do not want to move. They do not see better prospects elsewhere – certainly not in Altoostyd – and they are at home in the Bushveld. “I like the farms,” says Sekoboane. “I want to see the animals, the birds and the plants.” They have formed their own organisation to start doing things for themselves. They want Leseding declared a township so they can build good houses. They want proper municipal services. Above all, they want to be at the centre of the decisions that determine their future.



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The Waterberg coal plans and pipe dreams are being developed and debated against the background of increasingly alarming climate change. These plans are not recognised for what they are: the straws that are breaking the camel’s back. In this they reflect the South African government’s eyes wide shut approach to climate change, with Ramaphosa and Mantashe representing coal mining as ‘a sunrise industry’¹⁸⁶ even as climate scientists issue final warnings that action to cut emissions to zero and restore ecosystems is required NOW. Doing this requires not only a rapid transition from coal to renewables, but a larger societal transformation – a just transition to an egalitarian society that provides for all.

This chapter looks at the escalating impacts of climate change, considers some of the latest scientific reports and government’s purblind response. It then draws some conclusions from what we have observed in the Waterberg.

Climate beyond dangerous

The South African government readily accepts that climate change is happening but appears oblivious to the immediate urgency of responding to climate change. In July this year, scientists from leading climate institutions warned of “the risk that self-reinforcing feedbacks could push the Earth System toward a planetary threshold that, if crossed, could prevent stabilization of the climate at intermediate temperature rises and cause continued warming on a ‘Hothouse Earth’ pathway even as human emissions are reduced” [Steffen

186 See Ferial Haffajee, *Is this how Mantashe got the mining job?* Business Live, 4 March 2018; and Rebecca Campbell, *Minerals Minister defends coal, complains about high electricity prices*, Engineering News, 12 December 2018.



et al, 2018]. They emphasise that cascading feedbacks – where crossing one tipping point sets off the next – may be triggered at between 1.5° and 2°C warming above pre-industrial temperatures. This is runaway climate change leading to unliveable ‘hothouse earth’ conditions.

Warming is now at over 1°C above the 1850-1900 average. If pre-industrial is taken to be 1750, as used to be the case, warming is now at 1.2°C. This is already dangerous climate change: people are experiencing extreme heat, drought, hurricanes and floods; and some critical tipping points may be tipping but we won’t know for certain until after the event.

In South Africa, the metropolitan cities of Cape Town and Port Elizabeth narrowly escaped having the taps run dry. Cape Town got good early winter rains in 2018 for the first time in three years. But dam levels recovered from such a low point that, at 70% in early December, they are still well below pre-drought levels. Port Elizabeth got good spring rains but the combined dams are just over half full. So both cities go into the dry summer season with below average stores of water. Some smaller towns are still in crisis. Beaufort West’s Gamka Dam ran out of water in August. The hoped for early summer rains did not materialise and, in early December, the dam is still literally empty. The town is surviving on groundwater from bore holes, several of which have run dry. For the second year in a row, large parts of the southern Cape have been consumed by wildfires. At least nine people were killed in the 2018 fires. The intensity of both drought and fire is increased by the industrial timber plantations that cover large parts of the southern Cape and the catchments around Cape Town.

To the north, meanwhile, the shallow Lake Chilwa in Malawi dried up in the second half of 2018. This has happened before but it is now happening more frequently because of recurring drought and the degradation of the catchment. The area is densely settled with people making a living off farming and fishing. The boats are now marooned and many thousands are moving in search of a way to survive.¹⁸⁷ They join the millions of people on the move across southern Africa because of bad weather or bad politics. Or, of course, the combination of

¹⁸⁷ AFP, *Receding Malawi lake lays bare cost of climate change*, News24, 27 November 2018.



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the two when bad politics makes the impacts of bad weather worse or where governments simply avoid serious action on climate change.

Drought, heat waves and wildfires also afflicted Europe. In Greece, 20 people died in wildfires. Fires also swept across Sweden as July temperatures reached over 35°C – about 12° above average – and the country experienced unprecedented drought. In North America, wildfires devastated California, killing over 100 people. California is prone to fire but this was the worst on record. On the opposite side of the country, Hurricane Florence brought heavy flooding to the Carolinas, killing more than 30 people. In East Asia, Typhoon Mangkhut killed more than 70 people in the Philippines.

Meanwhile, the caravan of migrants from central America arrived to a hostile reception at the US border in November 2018. Many of the people walking north say they have been forced to abandon their home countries because of poverty and gang violence in Guatemala, Honduras and El Salvador. But many were already internally displaced and encountered the violence when they arrived in the cities of Central America. Before that, they lost their small farms after four years of “drought fuelled by El Niño ... occasionally punctuated by disastrous flooding rains”.¹⁸⁸ And before that, these are all countries in what the US used to call its backyard, drained of resources over the better part of a century to the profit of imperial corporations.

An El Niño affects the weather all over the world, bringing drought to some areas and floods to others. It is caused by an upwelling of warm water in the Pacific Ocean that spreads westwards along the equator from South America and raises the global temperature. Thus, the Central American drought coincided with the southern African drought. Another El Niño is now forming in the eastern Pacific, barely a year after the last one subsided. It may, or may not, be less powerful and long lasting but the people of these regions should prepare for yet another dry, hot season.

The 2015 Paris Agreement on climate change says that global warming must be kept well below 2°C and, if possible, below 1.5°C. Having signed on to that, the

¹⁸⁸ Oliver Milman, Emily Holden and David Agren, *The unseen driver behind the migrant caravan: climate change*, The Guardian, 30 October 2018.



parties to the agreement – all national governments – asked the International Panel on Climate Change (IPCC) – the scientists – to prepare a special report on the implications of 1.5°C warming. They published their Special Report on Global Warming of 1.5°C (SR 1.5) in October 2018.

They found that the impacts of climate change at 1.5°C warming will be much more severe, particularly for the poorest half of the world's people, than present impacts. Moreover, the 1.5°C mark could be crossed as early as 2030 – twelve years' time – if greenhouse gases emissions are not rapidly reduced. At 2°C, the impacts would be exponentially more dangerous and there would be a much higher risk of runaway climate change. Already, at 1°C, the collapse of agriculture is threatened in some regions – notably in Africa, including the Western Cape – and the collapse of global fisheries from ocean warming and acidification, as well as industrial over-fishing, is in process.

They argue that it is just possible to keep warming to 1.5°C but this “would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems. These systems transitions are unprecedented in terms of scale ... and imply deep emissions reductions in all sectors ...” [IPCC 2018: 21]. The very steep cuts in emissions would have to be accompanied by the restoration of ecosystems – such as natural forests, grasslands and soils – that absorb carbon dioxide from the atmosphere. That restoration is also necessary because the degradation of ecosystems exacerbates the impacts of climate change.

The IPCC's Fifth Assessment Report (IPCC AR5), in 2014, showed that the global carbon budget for a one-in-two (50%) chance of avoiding 1.5°C is all but used up. These calculations did not account for feedbacks or for the reduction of sulphur aerosols – which have a cooling effect – that necessarily accompanies the reduction in carbon emissions. The budget for a two-in-three (66%) chance of avoiding 2°C is similarly depleted. As we argued in the 2017 groundWork Report, following Rahmstorf and Levermann [2017], if global emissions peak by 2020, they will need to decline to zero by 2040 to keep under 2°C – and that assessment does not account for feedbacks or the



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reduction in sulphur aerosols [Rahmstorf and Levermann, 2017]. If emissions peak only in 2025, it is too late for 2°C.

This means that all countries, including South Africa, have less than twenty years to get to zero. Effectively, there is no carbon budget left to share out. Besides, burning more coal has not and will not 'lift' people out of poverty. Hence, equity between North and South – in terms of 'common but differentiated responsibilities' – must now be pursued through financial and technology transfers. This may be considered as part payment of the climate debt owed by the rich world to the poor world. But it must also be remembered that there is a climate debt from rich to poor in Africa and within South Africa. Finally, energy planning must be about a rapid transition from coal to renewables and it must be embedded in the larger conception of a just transition to an egalitarian society that provides for all.

South Africa pretends to climate action

The South African government has produced multiple responses to climate change but none of them seem designed to actually work. Thus, Treasury has been debating a tax on carbon emissions from big business since 2010 and, eight years later, has finally published a draft Bill which it hopes to bring to parliament for enactment in 2019. In that time, it has consulted widely and ignored all views that do not fit with its market oriented view of the world – that is, all but business. The result is a tax that is set low at R120 per tonne of CO₂e emitted, and comes with so many loopholes that the actual rate will be between R6 and R40 per tonne. The loopholes include carbon trading to allow polluters to buy carbon credits, which are claimed to represent reductions in emissions, to 'offset' actual emissions. Carbon trading is a notorious false solution to climate change and a recipe for corporate scams. Treasury's tax will make no difference to emissions whatsoever. Its function is to substitute action with an appearance of action.

Underlying that function is the need to protect capital. Treasury argues that the externalised costs of environmental degradation would be internalised in the



price of goods and services by virtue of the tax.¹⁸⁹ In this view, environmental ruin is a ‘market failure’ and will be corrected by getting prices right. It is doubtful, however, that profits exceed the externalised costs. Indeed, a study for ‘The Economics of Ecosystems and Biodiversity’ (TEEB) shows that externalities exceed revenues – income before costs – in most industrial sectors [Trucost 2013]. We may conclude that externalisation is not so much a ‘market failure’ but the pre-condition for the profitability of corporates operating across the economy and for capital in general – that is, for investors.

At the same time, the DEA has introduced a draft Climate Bill. It allows the minister to develop an adaptation strategy and provides for three main measures for mitigation: an overall national emissions trajectory – already defined as the ‘peak, plateau and decline’ (PPD) trajectory; emissions targets for industrial sectors; and carbon budgets for big polluters – that is, a limit on what they can emit. The last of these is the only measure that can be enforced but penalties are mild and, as with the minimum emission standards, the Bill allows for the postponement of compliance. Carbon budgets are also to be reviewed in relation to the national emissions trajectory. The IRP 2018 was apparently discussed with the DEA and gives a foretaste of how this will work in practice. It implicitly defines the power sector target and Eskom’s carbon budget.

The IRP – no limit on carbon emissions

IRP 2018 says it does not count the externality costs of carbon emissions because “the CO₂ emissions constraint imposed during the technical modelling indirectly imposes the costs to CO₂ from electricity generation” [25]. In other words, they put a limit on how much CO₂ can be emitted instead of costing the climate damage from burning coal to generate electricity. But the limit on CO₂ emissions is not real. The IRP says ‘mind your head’ when it has made the ceiling four metres high.

The IRP claims to have two approaches to imposing a carbon constraint. The first is to follow the PPD trajectory adopted by IRP 2010. The PPD has a wide

¹⁸⁹ Treasury, *Carbon Tax Policy Paper*, 2010.



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range with an upper and a lower limit. IRP 2010 ignored the lower bound and took the upper limit to define its trajectory. IRP 2018 does the same and so allows power sector emissions of 275 Mt CO₂ a year through to 2035. The second approach is to allocate a carbon budget to the power sector for each decade. For 2021-2030, the budget is 2 750 Mt CO₂ – that is, 275 Mt a year – the same as the upper PPD limit.

Eskom's emissions in the year to March 2018 were 205 Mt CO₂. Emissions from non-Eskom generators (mainly Sasol) were less than 10 Mt/y. So the IRP allows 60 Mt/y more than the sector emits at present for the whole decade of the 2020s. In this period, the IRP adds the remaining Medupi and Kusile units as well as the privatised Thabametsi and Khanyisa coal plants (6 732 MW in total) while six of Eskom's plants (12 600 MW) are scheduled for end-of-life closure. The IRP produced seven scenarios with various combinations of technology and most put emissions in 2030 at around 215 Mt.

For the decade of the 2030s, upper PPD keeps emissions at 275 Mt/y to 2035. In the five years from 2036, it reduces emissions by 5 Mt each year. It thus allows a total of 2 675 Mt CO₂ for the decade. The carbon budget approach allows 1 800 Mt. None of the IRP scenarios come close to reaching either limit so there is no constraint.

For the next decade, upper PPD starts at 243 Mt in 2041 and declines to 192 Mt in 2050 for an average of 217 Mt/y over the decade, which is no reduction on present emissions. Under the carbon budget approach, the IRP allows 920 Mt for the decade. Two scenarios exceed this limit. But the 'least cost' scenario comes in below this limit and also below the 'carbon budget' scenarios. The 'least cost' scenario is the only one that does not place an arbitrary constraint on how much renewable energy is built each year. So government can improve on its 'carbon budget' simply by removing the constraint on renewables. A normal IRP process would designate 'least cost' as 'business as usual'. We should indeed spend more than 'least cost', but to further reduce emissions, not to increase them.

Thus, the 'carbon budget' scenarios merely pretend to put a limit on carbon emissions. These scenarios retain the constraint on how much renewable



energy can be built each year and introduce new nuclear plants, at a hefty cost premium, to meet the limit on emissions. This seems to be their real function – they keep nukes on the table.

The climate imperative is to reduce to zero emissions by 2040, not just for the power sector but for the whole economy, if we are to avoid making much of the earth unliveable within what might otherwise be the life-time of today's youth. The IRP fritters the time away. It represents the refusal to recognise the real consequences of emissions from burning coal, oil and gas. It is a form of climate denial.

Undercounting health costs

Climate change is already impacting on people's health. The Lancet Countdown is a new initiative to track those impacts annually. The 2018 Countdown finds rising threats to people's health and to the viability of health systems, hospitals and clinics. Health risks include the spread of diseases such as malaria, dengue fever and cholera. And millions more people are exposed to extreme heat, resulting in a loss of work and increased incidence of heat stress and deadly heat stroke. Amongst other things, heat exacerbates the effects of air pollution.

The IRP 2018 does put a value on the externalised costs of emissions of nitrogen oxides (NO_x), sulphur dioxide (should be SO_2 , not SO_x), mercury (Hg) and particulate matter (PM). It says, "These externality costs reflect the cost to society because of the activities of a third party [i. e. Eskom and other electricity generators] resulting in social, health, environmental, degradation or other costs" (sic) [25]. In other words, these numbers represent people dying prematurely or living with debilitating diseases caused by emissions. The IRP is, however, too discrete to tell us how many people's lives are ruined or what value it puts on their lives.

Table 7 below shows the cost in Rand per kilogram that the IRP attributes to each species of pollution and compares it with low end values (converted to Rand) from the European Environment Agency. We have left out mercury because the IRP figure is wrong and it's not clear if this is a typo or a blunder.



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Table 7: IRP local emission externality costs

	NO _x (R/kg)	SO ₂ (R/kg)	PM (R/kg)
IRP	4.455	7.6	11.318
EEA	82.7	198.48	413.5
Ratio EU/SA	18.56	26.12	36.53

The implication is that European lives are valued at between 18 times more (NO_x) and 36 times more (PM) than a South African life. Comparisons of this sort are always invidious because the lives of the rich are given a higher value than the lives of the poor. But even if we allow for the fact that Europeans are 5.5 times richer than South Africans (GDP per person), the South African government still puts a very low value on the lives of its people.

The real costs to people are appalling, as Mike Holland shows. Emissions of just one species of pollution – fine particulate matter – from Eskom result in over 2 200 premature deaths every year. Tens of thousands more people are afflicted with asthma and bronchitis. Thousands are, or should be, admitted to hospital, many more suffer ‘restricted activity days’ – days when they cannot function normally – and every year about a million working days are lost. This costs the economy some R33 billion, but the human costs are much higher and are not evenly distributed. As Holland observes, “air pollution most affects those whose underlying health condition is worst,” and hence that any improvement in air quality will most benefit those who are most disadvantaged [Holland, 2017].

The IRP externalities are only for emissions to air from the power stations. They do not take account of the pollution of water and land from coal stockpiles, ash heaps and acid deposition. Nor do they take account of the massive impacts of the coal mines on air, water and land as well as on people’s health. The Waterberg has been put on notice for air quality problems – Eskom has delayed installing SO₂ scrubbers at Medupi and has no intention of installing them at Matimba. Meanwhile, Grootegeluk’s discard dumps are still smouldering and releasing a cocktail of dangerous gases at ground level.



These emissions will increase under current expansion plans, starting with Thabametsi. A swathe of land to the southwest of the two power stations and mine is marked by the brown colour of its vegetation and the farmers complain that their fences are rusting. This land is already considered sterilised – unusable – for housing development.

A rapid phase out of coal will immediately clean up the air and create the conditions for restoring earth. This is why the Lancet Commission on Health and Climate Change says that “tackling climate change could be the greatest global health opportunity of this century” [Watts et al, 2015]. Fixing the damage – rehabilitating not just mines but whole mining regions – would also require much work and should be conceived as an integral part of a just transition.

Coal’s last ditch

The Waterberg is South Africa’s last coal frontier in more than one sense. For coal boosters, those who see a sunrise in coal mining – in reckless defiance of climate change, local pollution, local impacts on people, threats to the social fabric, impossible burdens on the infrastructure that municipalities are responsible for (and on which people depend) – it is the last place to extend the life of coal-fired power, and make money. For us, it is coal’s last stand and a battlefield for our energy future.

Two energy futures are possible. The one will force unwilling nature. It starts with bad quality coal which requires lots of water to wash it up to a saleable product, and it results in large amounts of waste including the smouldering discard dumps and power station ash heaps. And Gauteng’s ‘surplus effluent’ must be brought to the dry Waterberg to sustain the unsustainable. The result will be a giant mess.

The other future starts with a rapid phase out of coal and a people’s plan for a just transition to renewable energy and a more equal society. It must include a major effort to restore ecosystems – starting with those destroyed by the coal



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economy – that can absorb carbon dioxide and offer resilience in the face of climate change that is already in the pipeline.

We feel a sense of urgency as we complete this report on mining and burning coal in the Waterberg. The groundWork Reports are about environmental justice and there is much environmental injustice in the Waterberg. We have seen how the two big parastatals – Iscor and Eskom – together with the local white elite, fixed apartheid's racist geography on the area. In particular, placing a township that today houses 30 000 people at the foot of the Matimba power station, where they experience severe pollution, is a stark example of environmental racism.

The costs are imposed on people who are polluted, displaced and caught in cycles of despair and false hope about jobs that are promised and do not materialise. Costs are also imposed directly onto the environments people live in. This shows particularly clearly in what was done to the Mokolo River through two cycles of boom and bust in the Waterberg: It was dammed, its flood regime interrupted, its sand bed choked by reeds which were then sprayed with poison and its capacity as a sand aquifer damaged by large scale and illegal sand mining. Finally, the dam was fitted with a pipeline with the capacity to drain the whole of the river's annual yield.

The boom and bust cycles induced by the mega projects has stressed a local government that is itself plagued by weak management and dysfunctional systems. This has serious consequences for service delivery and a local politics in which jobs, and who controls who gets them, have been made into the coin of patronage. The mega project booms are also addictive. The misguided insistence on coal based 'development', as if to snatch the last crumbs of wealth from fossil fuels, is sustained in the dangerous fantasy world of overestimated benefits and underestimated costs.

We conclude that:

- At a time when the impacts of climate change are increasingly devastating, developing more coal mines and power stations constitutes climate crime. The fight against coal is part of the fight for climate justice.



- More coal projects would also lead to mountains of waste with smouldering discard dumps and large ash heaps producing pollution at ground level.
- The Waterberg is not the next coal frontier in South Africa. The projects that make up Boom 3 are floundering and cannot compete with Exxaro. But the prospect still 'sterilises' the land for other uses and some projects may survive long enough to ruin more land before going bust. This is reason for resistance.
- Grootegeluk has long since taken the best spot on the coal field. Further, Exxaro inherited the benefits of large public subsidies from the parastatal Iscor including: support for the construction of the mine and washing plants; the sweet deal with Eskom; the rail infrastructure provided by Transnet; and the Mokolo Dam provided by government. It was also subsidised through a generous water allocation and can now use the surplus to expand its coal mining and supply Thabametsi power station.
- The rush to develop the Waterberg coalfield has real consequences. In particular, the very scarce water resources are threatened not only because they are over allocated, but also because the MCWAP pipeline will bring really dirty water – literally the shit from Gauteng – into the local catchments.
- Eskom has always avoided doing anything about SO₂ pollution. It is now also avoiding compliance with minimum emission standards which are substantially more relaxed than the World Health Organisation guidelines. We are concerned that Eskom's research into SO₂ and acidification in the Waterberg has not been opened to public scrutiny and that Eskom continues to capture scientific research to justify not acting on pollution. This puts people's lives at risk.
- These mega projects – Medupi and Kusile – have harmed the national economy, the local economy, local people and the environment. And they have diverted resources from providing the infrastructure and services that people need.



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- The Lephalale mega projects produced cycles of boom and bust and entrenched inequality. The rich took the opportunities while the poor were priced out of the market. Construction created thousands of temporary jobs but, in the context of high unemployment across the region, thousands more came looking for work. The influx of young men exacerbated harsh gender relations. The bust will compound the ill effects of the boom and the unemployment rate will be higher than before the boom.
- The mega projects intensified the dynamic for enclosure. After generations of dispossession, people who still managed to hold onto some land rights are now landless and unemployed.
- Environmental justice organisations have led the public and political debates on protecting public health against air pollution and on energy democracy and climate change action. Against the odds, and in the face of spying and surveillance, they have opposed the coal based mega projects and the associated concentration of wealth. They envision a different society, as intimated in the pithy call to ‘change the system, not the climate’.

Solidarity in a time of climate change

The present elite energy system in South Africa is locked into coal which destroys people’s health and livelihoods along with the land and water. It has created an economy with 36% unemployment but the elite nevertheless ignore the need for an urgent Just Transition. This kind of response is not only evident here. It was also evident at the 2018 climate negotiations in Poland, sponsored by that country’s largest coal corporations. This signals, not for the first time, that governments are in bed with the coal and other fossil fuel industries and willing to push the world well beyond 2 degrees.

In South Africa, people’s organisations and movements, together with environmental justice NGOs and the health sector, have called on government to speedily move towards renewable energy and away from fossil fuels. People’s submissions to parliament on the IRP and statements from people’s



gatherings and protests against the extraction of coal, oil and gas, have said, no more fossil fuels, no more pollution, no more carbon.¹⁹⁰

Previous groundWork Reports, including two reports on mining and burning coal on the Mpumalanga Highveld,¹⁹¹ have documented how development shaped by economic growth has not merely failed to provide a better life for all, but has actively reproduced poverty and environmental destruction. In the Waterberg, the promises of prosperity made by the proponents of the mega projects are as empty as the promises made by every two bit mining corporation with a new prospect.

Instead, we should ask what people need to live well with each other and with the earth. How can people meet their physical needs for food, energy and clean water without destroying the very resources we live on? How can we meet our social needs for affection and fun? And how will we develop our understanding of the world and the dynamics around us so that we can participate fully in the making of the life after coal, in understanding what mining has done to our environments and in creating new possibilities founded on a love of life?

A debate of this sort is a way of opening a path to a society in which people are actively and consciously making the decisions that shape our collective future. It is a path of struggle. It does not promise a smooth process with a certain outcome. But the possibilities that emerge will come from the people and what we learn along the way. This generation – and future generations even more – will have to deal with the growing impacts of climate change. This will require a paradigm shift. We believe that this shift should be reflected in a change in the central organising principle of our economy – from economic growth to sustainability founded on economic, social and environmental justice. This means a commitment to growing human solidarity and equality as well as a relationship to the environment that enhances rather than degrades the functioning of eco-systems both for their intrinsic value and ‘ecological services’ they provide.

190 Our Life, Our Water, Our Sea, Our Air, Our Land – Statement from the National Gasdown Frackdown Gathering – 10 – 12 October in Durban, South Africa; and Statement of Karoo people and organisations: United in the Fight Against Fracking, 18 November 2018.

191 The Destruction of the Highveld Parts 1 and 2 in 2016 and 2017.



Into the climate storm

What this means for the Waterberg, its people, its environments and the burdens of 'development' imposed on them, is a question that needs to be answered in a debate in which the people – all the people – of the Waterberg should take the lead.

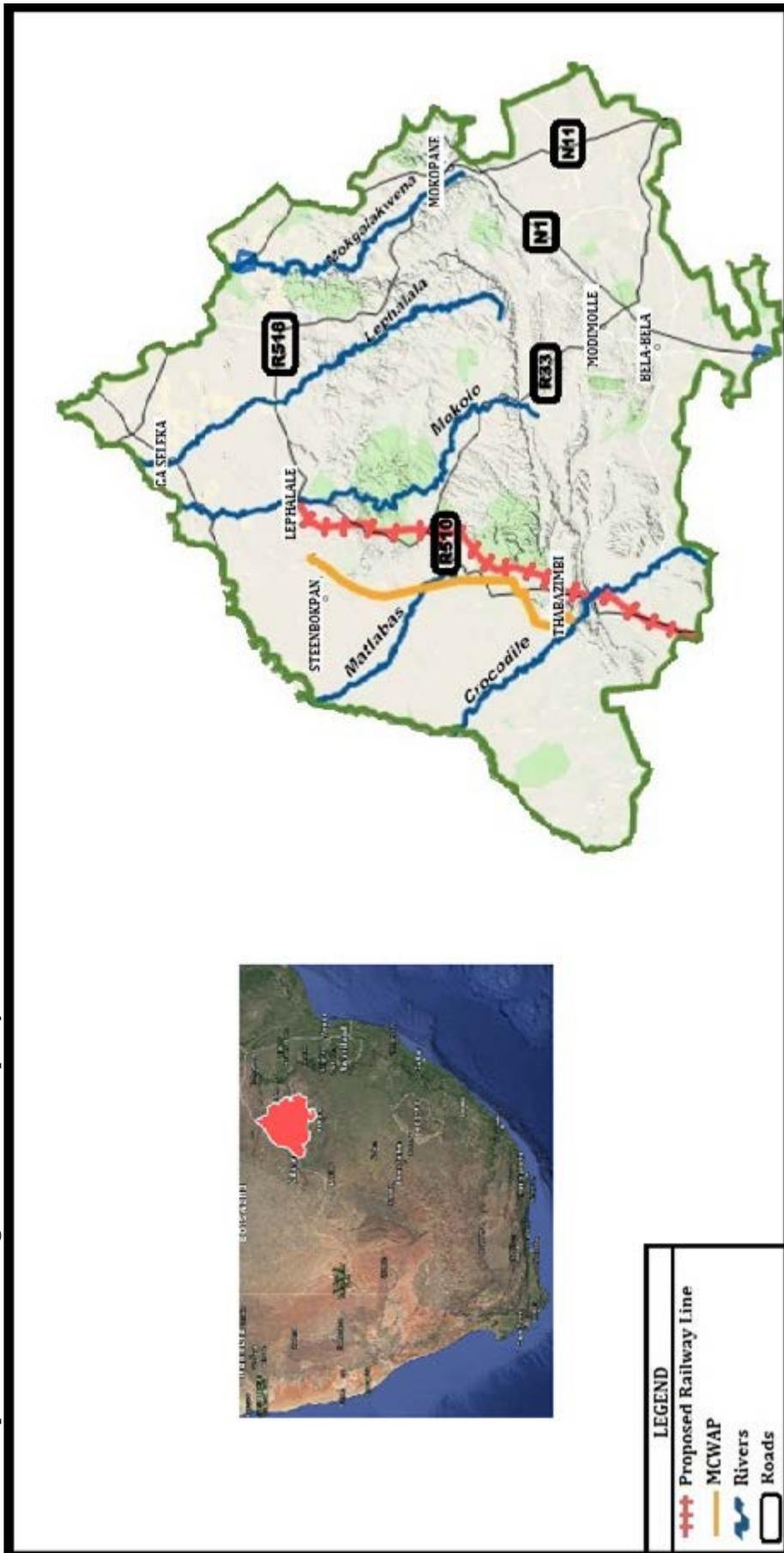


Map 1: Lephale town with Grootegeluk, Matimba and Medupi

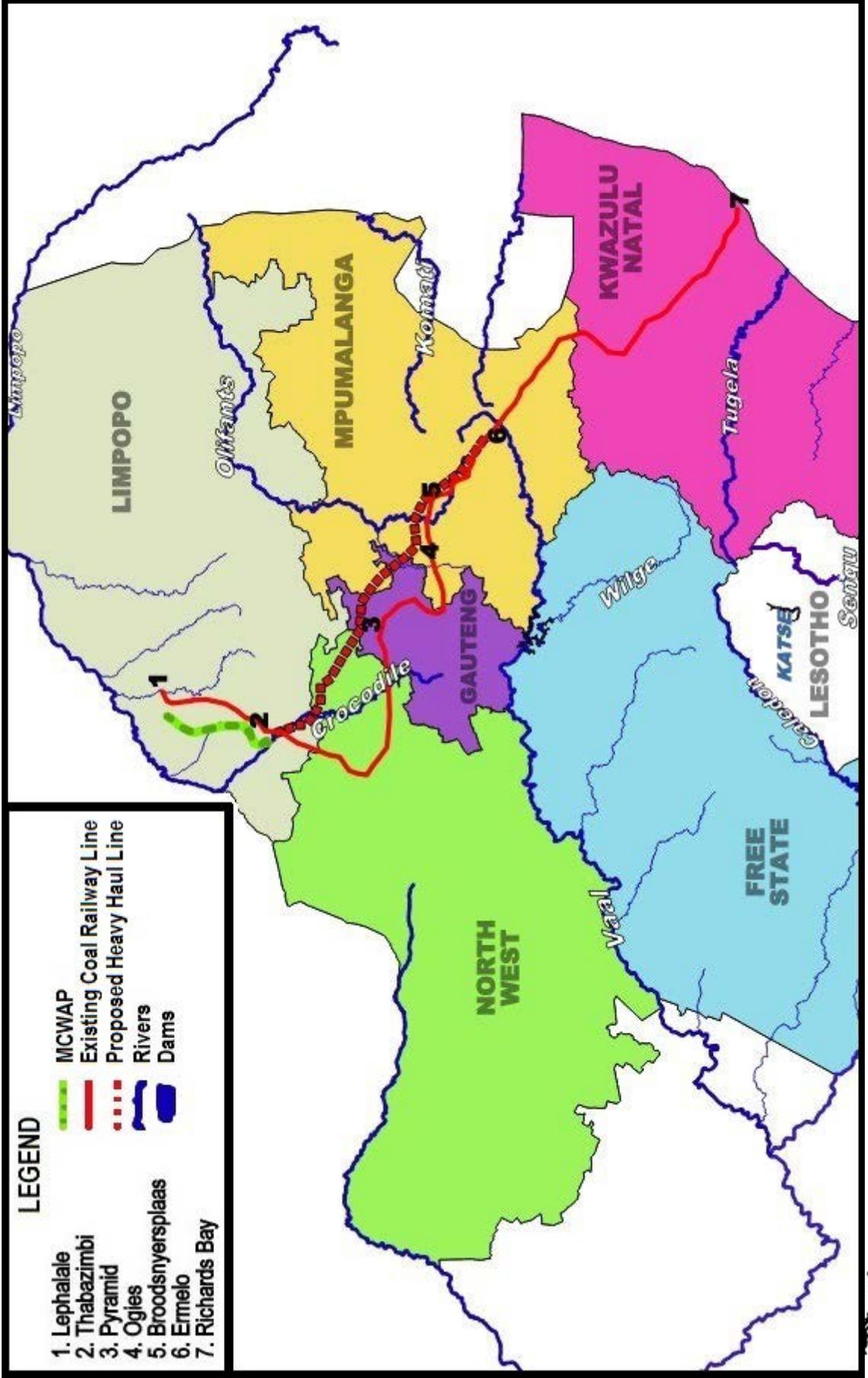




Map 2: The Waterberg District Municipality

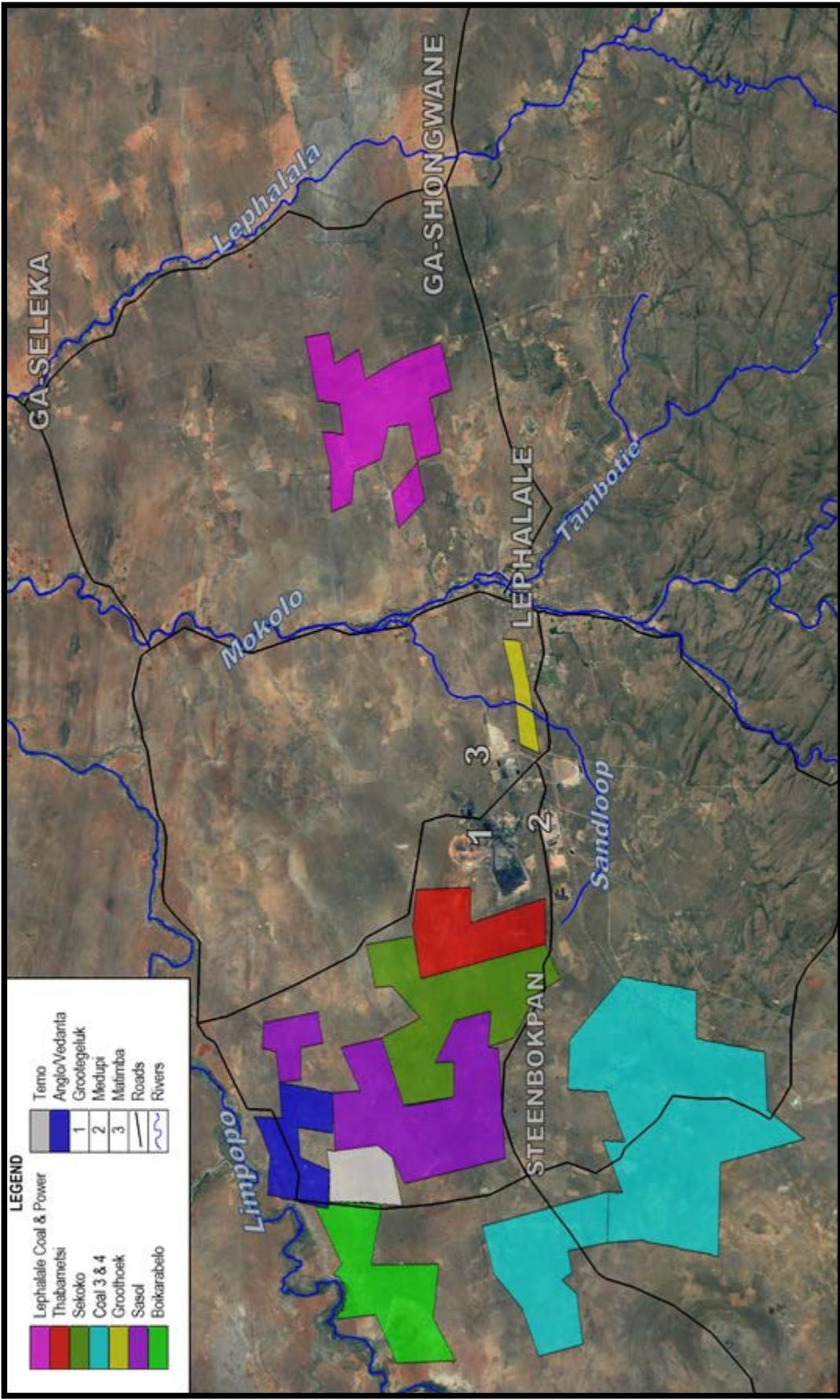


Map 3: Tying in the Waterberg: water and rail across the country





Map 4: Proposed Boom 3 projects



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The Waterberg is touted as South Africa's next coal frontier by industry and government. It has already seen two rounds of boom and bust driven by mega projects. The first was in the 1980s when the original Grootegeluk mine and the very large Matimba power station were constructed. The second boom kicked off in 2007 with a major expansion of Grootegeluk, to create one of the largest open cast mines in the world, and the construction of Medupi – advertised by Eskom as the fourth biggest power station in the world. It is also the biggest threat to Eskom's future and to the national economy.

These mega projects have reshaped the Waterberg. The first turned the remote apartheid village of Ellisras into a town, now called Lephalale, of fragmented parts. The second initiated a dream of creating South Africa's 'first democratic city'. But the boom tore into the local social fabric, benefitting the rich at the cost of the poor and entrenching brutally unequal gender relations. The bust is now compounding the ill effects. Meanwhile, the Mokolo River has been irreversibly damaged and the air is heavily polluted.

A third boom is now hoped for. The coal bosses dream of ripping out hundreds of square kilometres of the delicate bushveld while government aims to "unlock the mineral wealth of the Waterberg" by delivering Gauteng's sewer water to this arid area and massively expanding the coal line from Lephalale to the Highveld and on to Richards Bay for export. For this, they must ignore air and water pollution; pretend that climate change is small change; and maintain ignorance of the impacts on people.

This report argues that coal's next frontier looks more like coal's last ditch. It is facing stiff resistance on a battlefield for our energy future and its own positions are crumbling. Another energy future is necessary as a matter of survival and requires a rapid phase out of coal and a just transition to people's power and a more equal society.

