Electricity – 'Green is the new gold' 1 August 2022

Before we go any further, let's deal with load shedding. It will still be with us until the end of 2024. There is no short-term fix for Eskom. It needs new capacity to stop load shedding. 'Finish en klaar'. We discuss the detail on page 3. Having said that, let's look at the bigger picture and the longer term.

In one week we got three big announcements on electricity in South Africa. First the President addressed the nation and outlined how government intends to deal with Eskom, load shedding and the future of the electricity industry. Two days later Eskom showed its hand at a coal transition indaba on how it sees the energy picture unfolding and what investment it would entail. The following day Treasury lifted the veil on its plans for Eskom's debt. There is a remarkable alignment and consistency between the three announcements and together they paint a clear picture of a huge game changer for South Africa.

Why is electricity a game changer?

Firstly, we are moving from a state monopoly in electricity to a free market where people can risk their own money to build plants, generate power and sell it to their chosen customers. Customers will have the option to buy from different suppliers. Traders are already operating, connecting buyers and seller of electricity. It is a remarkable change and brings South Africa in line with best practice elsewhere in the world, employed with great success from the Netherlands to China.

Secondly, we are moving from a coal-based electricity system to one largely based on solar, wind and gas. Coal will still be used for a long time as both Medupi and Kusile are coal-fired and they have 40 years to run, but the switch is undeniable and irreversible. Coal's share of our energy needs will decline from over 70% to below 50% and then decline further.

From one of the biggest carbon emitters in the world South Africa will become a country that is doing what is necessary to limit climate warming to 1,5 degrees. This will protect our exports and give us access to markets that will increasingly be closed to non-compliant countries. Whether one produces wine or BMWs, if carbon intensive electricity was used to produce them, access to some markets will suffer. Domestically the switch will help to clean filthy air in parts of Mpumalanga and leave a healthier population. Concurrently, it will create more jobs in rural areas of the country.

Thirdly, all of this will unleash enormous investment acting as a spur for the country's growth over the next decade and more. Eskom foresee R1,2 trillion investment over the next 8 years to 2030. And that is only the beginning. More investment will take place after 2030. Already we have seen that local and overseas investors have a big appetite for investment in South African renewable energy – every single bid window so far is over-subscribed. Energy is the new investment frontier of South Africa and it will do for the country what the discovery of minerals like diamonds and gold did. Just ignore those who lament that South Africa is not investable – the ground has already shifted under them; they just have not noticed yet.

Fourthly, the energy transition opens the way for industrialisation to follow in its wake. Solar panels, batteries, cables and transmission lines or parts thereof can be manufactured here. A few examples: Swedish energy storage specialist Polarium opened a lithium-ion battery assembly plant in Montague Park, Cape Town. The world's biggest vanadium producer, Bushveld Minerals, is engaged in electrolyte and battery manufacturing, building a new factory in East

London. The company wants to be more than a miner and become a big player in electricity storage.

The biggest industrialisation potential may be with hydrogen, on which South Africa and Germany have recently concluded co-operation agreements, but that is the topic of a future note.

It is worth remembering that the industrialisation of South Africa started in the 1920s and followed the growth of the mining industry. In the 60 years between 1924 and the 1984 South Africa leveraged its mining endowment to build a modern and diversified economy – certainly the most diversified in Africa. Even our sophisticated capital and financial markets can be traced back to the mineral discoveries. Energy can make it happen again. As the President himself said: ‘Green is the new gold’.

Opposition

The attached timeline shows that the Ramaphosa government has taken 12 political decisions on electricity between 2018 and 2022. It changed, on a policy and practical level, the electricity landscape in South Africa. Not everybody is supportive. Many people think the way energy is going in South Africa is the wrong way.

As I was writing this, the SACP at the ANC’s Policy Conference was growling that the state should do electricity. The South African Local Government Association (SALGA) has launched a court application that only municipalities may sell power – they obviously want to protect their income streams. Even if they win the court case, they will lose the battle.

The train carrying the new energy vision has left the station. It is not going to stop or reverse. It is testimony to political will and skill. Love Ramaphosa’s process-driven approach or hate it, it is giving us energy results. He has brought recalcitrant ministers, lobby groups, sceptical constituencies and the like around. The timeline of decisions speak for itself – in 2017 he stated his position and it is systematically becoming reality.

Investment

At an indaba in Johannesburg Eskom disclosed some concrete numbers on the new energy landscape. To meet the country’s energy needs R1,2 trillion will have to be invested in new generation capacity by 2030. Given Eskom’s tight financial position, most of it will come from the private sector, as has been the case so far in most renewable projects.

Eskom foresees 50 000 MW to 60 000 MW (50GW to 60GW) of new generation capacity to be installed from renewable sources; 10 000 MW of storage and 6 000 MW of gas – again, all by 2030. Eskom made it clear they will not build any coal power stations. (Neither they nor anybody else are likely to get money to build it.) Gas will help to smooth out the intermittent supply from renewables. If the son does not shine or the wind does not blow gas can be switched on to meet the shortfall and be switched off again when the sun and wind return. Coal and nuclear cannot be switched on and off. The combination of renewables, storage (batteries) and gas plus coal fired stations we still have, will provide the country with the base load needed to run the economy.

In addition to generation, Eskom foresees that R130 billion will be needed for 8 000 km of transmission lines and some 100 new sub-stations.

Eskom has already embarked on a battery storage programme, aptly named BESS (battery energy storage system). CEO Andre de Ruyter has negotiated a R11 billion loan from the World Bank for BESS. The first R4,4 billion worth of contracts have been awarded to Hyosung from South Korea and Pinggao of China. BESS will be installed at Skaapvlei, Paleisheuwel, Graafwater, Pongola, Elandskop and Hexrivier where renewable producers are located. Luckily prices were negotiated before the recent spikes caused by the war on Ukraine.

Eskom debt

Eskom's debt is running at roughly R400 billion and it is generally accepted that the utility cannot 'trade out of it'. Some restructuring is needed. Details will be disclosed in the 'mini-budget' in October, but it is safe to speculate that as much as half of that could be taken over by Treasury and added to the country's national debt.

R327 billion of Eskom debt is already guaranteed by government any way. It is equal to 78% of all government guarantees for public institutions like SAA, Denel, Sanral, the Land Bank and others. Rating agency Moody's already include such contingent liability in total government debt in rating the country's debt worthiness. Economist Elna Moolman (again rated for the umpteenth time as best domestic economist on the JSE) reckons that if R200 billion of Eskom's is moved to Treasury the country's debt will stabilise at 78% of GDP rather than 75%. She reckons the change is not big enough to result in a ratings change. So, shuffling some debt between Treasury and Eskom should not be too onerous.

It is worth noting that government is also guaranteeing the power purchase contracts which independent power producers have with Eskom and to the tune of R177 billion (50% of what the Eskom guarantees are). If Eskom stops buying the renewable power, the taxpayer will step in. These guarantees were issued to get the original renewables programme off the ground. (Certainly a sweet deal if you could get it!) In a free electricity market arrangements like that will fall away.

A bigger problem is that Eskom bondholders must agree to the breaking up of Eskom and resulting division of assets between the three resulting companies. Some have indicated reluctance to do so. It will require some fancy footwork and negotiation to pull that off, but Treasury taking over some the debt should help to get those bondholders over the line.

When will load shedding end?

The short answer is when 6 000 MW of additional capacity has been installed. That will in all likelihood be by the end of 2024. All the various decisions announced on electricity has by now resulted in more than 14 000 MW of renewables being procured. (That excludes anything from Karpowership, which I hope will fail.) That 14 000 MW should be connected and operational by end 2024. Until that has been done, we will experience load shedding.

Previously Eskom management was expecting to end load shedding by September 2022 relying on 'reliability maintenance' to improve performance. However, repeated incidents of sabotage and problems around maintenance programs put paid to those ambitions.

If Eskom's performance improves significantly load shedding can end earlier. Likewise, if all the units at Medupi and Kusile come into operation earlier than currently scheduled, the 2024 date can move earlier. The horror story that is Medupi and Kusile is well known and need not be repeated. But an improvement is possible. Medupi manager Zweli Witbooi revealed to a media contingent that three of the six units at Medupi have run at more than 85% efficiency over the past year, with one unit averaging 92%. Mr Witbooi started as an engineer at Eskom 20 years ago – proving what difference proper training and experience can make. Apart from design flaws Medupi and Kusile are also under the whip to meet emission targets. That is scheduled to be fixed in 2022 and 2023.

Can all these plans be implemented?

Consider the following data points:

- After the President announced the 100 MW exemption in June 2021, there was the normal outcry from the usual suspects on 'red tape' and 'bureaucracy' that stifled new power projects. It took about 327 days to get a project

registered.

- The President created the Vulindlela office in the Presidency to drive, inter alia, electricity reforms.
- By June this year two 100 MW solar plants in the North West were approved within 79 days.
- Mining house Exxaro obtained registration for an 80 MW plant within 46 days.
- A further 16 projects were registered by NERSA within 19 days.

There has clearly been a step change.

Political will helps – take a look again at the 12 political decisions on the timeline. Co-operation helps too. The private sector has seconded staff to the Presidency, Eskom has beefed up the unit that has to evaluate technical specifications, environmental assessments and water licence approvals have been speeded up. It is useful to take note that some of the problems China's Belt & Road initiative are currently experiencing are because environmental and other assessments were not sufficiently conducted beforehand. There was 'no bureaucracy' and 'red tape' in China's Belt & Road…and now the chickens are coming home. Make haste slowly.

How much of the Integrated Resource Plan (IRP) 2019 has been implemented?

The IRP of 2019 covers the period to 2030. It provides for 9 400 MW of new solar and wind power to be procured by 2025. Currently 7 800 MW are on track to be procured by the 3rd quarter of 2022 with financial and technical closure early 2023. Clearly implementation of the IRP has been accelerated after a slow start.

Some contracts will fall by the wayside as the war on Ukraine has upset prices on which bids were based and bidders now cannot achieve financial closure. But the thrust is clear. More capacity will be acquired at adjusted prices.

The IRP provides for 513 MW of battery storage in 2022. That bid will be released in September. The IRP also provides for 3 000 MW of gas by 2027. That bid window will be released in November. Gas in particular will require substantial infrastructure and it will take some time to build and connect to the grid. (This work will probably be done by a government owned gas company and may well be the 'second Eskom' that has been bandied about.) In his television address the President gave the undertaking that further bid windows for renewables will be opened to clear the IRP.

Bear in mind that a lot of the action has shifted to Eskom (on battery storage) and the private sector (on renewables). Eskom's BESS in the first phase will amount to 199 MW and in later phases 360 MW of battery storage. In the private sector some 94 projects of 7 000 MWs are in process. Add all the numbers together and it is clear that the 2030 targets of the IRP will be comfortably beaten.

A new IRP is being drafted to reflect the country's changing needs and climate change commitments and will be released in 2023.

What happened to the Eskom War Room?

Several readers have asked why the President did not 'fix Eskom' when he was put in charge of the Eskom war room by then President Zuma in December 2014. After all, December 2014 is almost 8 years ago!

An official question and answer in 2019 in Parliament were quite revealing. Pieter Groenewald from the Freedom Front+ asked the President why the war room exercise had not solved the problems at Eskom. The President answered that after a short while in the War Room he reported back to President Zuma that 'there were too many entry points into Eskom, and he (Ramaphosa) could not get his hands around it'. He recommended to Zuma that the

war room be disbanded and that a CEO is appointed who can run the utility and be held accountable. In April 2015 then Minister Lynn Brown appointed Brian Molefe as acting CEO of Eskom. The rest, as the saying goes, is history.

One can only speculate on who all the people were that gained entry into Eskom and what their agendas were.

A second War Room was established in December 2019, after Stage 6 load shedding occurred that month. This one is headed by Deputy-President Mabuza. However, it appears that almost all decisions on electricity have migrated to the presidency where the President himself is overseeing electricity decisions.

So what?

- The Chinese word for crisis consists of two characters indicating danger and opportunity. South Africa's biggest danger currently is electricity, and its biggest opportunity is electricity.
- Load shedding will in all likelihood be with us until the end of 2024. 6 000 MW of new capacity must be installed to end it and enough investment is now in process to achieve that. Building and connecting to the grid will take 18 to 30 months.
- Electricity is about more than ending load shedding – it is about developing a whole new industry. It will require an investment of more than R1,2 trillion by 2030, and much more thereafter. Most of this money will come from the private sector and concessional funding. Reforming electricity is the biggest structural reform in South Africa since democracy. It will be a most important catalyst for investment, jobs and growth since the discovery of diamonds and gold.
- Electricity reform is clear evidence of how the government sees the role of new technology and private sector/government co-operation. The same approach is being introduced in freight transport, ports and water. In the latter sectors reform is not as far progressed as in electricity, but the policy direction is clear. As in electricity there will be opposition, pushback, setbacks in implementation and delay. But it is clear which way this government is going.
- All of this is of course dependent on this government remaining in power. August is the month when nominations will be made for ANC elections in December, giving us an important indication of where we stand. We will report on that next month.

An electricity timeline – political decisions on electricity and load shedding.

1. Load shedding first occurred in 2008. There was then six-year lull to 2014.
2. 2011 – South Africa launched what became a very successful programme on acquiring renewables. The first contracts very expensive and carried a government guarantee, but over time prices fell dramatically.
3. 2014 – load shedding recurred.
4. 2015 – Then Eskom CEO Brian Molefe refused to sign more independent power producer contracts, claiming they were expensive and nuclear was a better option.
5. 2017 – Deputy-President Ramaphosa called for an expansion of renewable energy to reduce carbon and create jobs, saying 'we could again become the investment destination of choice for activities that are electricity intensive.' Clear where his mind was. That December he was elected President of the ANC and the following February President of the country.

6. April 2018 – the Ramaphosa government signed the 27 independent power producer contracts suspended by Brian Molefe in 2015.
7. June 2018 – after a four-year lull load shedding recurred in June, and it was repeated in Nov and December.
8. February 2019 – in the state of the nation speech the President announced that Eskom will be split into three units: generation, transmission and distribution. Load shedding recurred intermittently from March to December.
9. October 2019 – the Integrated Resource Plan was released by Minister Gwede Mantashe. It tilted the country decisively away from coal to renewables and gas.
10. October 2019 – the Eskom road map is released by Minister Pravin Gordhan, spelling out the more detail on how the three different entities will operate and setting the vision of a non-monopolistic and fully decentralised energy system.
11. December 2019 – stage 6 load shedding hit the country the first time. From then on, the country regularly suffered load shedding.
12. August 2020 – the 'emergency power procurement' is released after Covid. Karpowership got 1 200 MW of the 2 000 MW emergency allocation. (At the time of writing the 1 200 MW Karpowership is encountering serious opposition and will hopefully be jettisoned. Of the remaining 800 MW only 150 MW have reached financial closure.)
13. October 2020 – regulations were changed to enable municipalities to procure their own power. There were lots of declarations and noise but at the time of writing only Cape Town has released a tender for a 300 MW.
14. October 2020 – the President forms the Vulindlela office in the Presidency to speed up implementation of reforms in general, but specifically on electricity.
15. April 2021 – Bid Window 5 for 2 600 MW was opened. Preferred bidders announced in October 2021.
16. June 2021 – the President announced that the exemption from acquiring a license for a power plant is lifted from 1 MW to 100 MW. (In May, the Minister of Energy still insisted that there is no need for an exemption of more than 10 MW.) The announcement also allowed for sellers and buyers of power to trade amongst themselves without resorting to Eskom.
17. November 2021 – South Africa reached a political agreement at COP26 for $8,3 billion (about R140 billion) of financing to help finance energy reform in South Africa.
18. February 2022 – Amendments to the Electricity Regulation Act to facilitate the break-up of Eskom and allow the development of a private electricity market were published for public comment. Public comments were made, and the Bill is now prepared for Parliament.
19. April 2022 – Bid Window 6 is opened; closure date is 11 August 2022.
20. July 2022 – the President announced that the 100 MW exemption is done away with completely; that a one-stop shop will be formed to help process registration for power projects; that no environmental impact studies would be needed in areas of low and medium environmental sensitivity; and that Eskom will develop a standard feed-in tariff at which consumers can sell electricity to the grid. Several measures to 'fix Eskom' were also announced and he reaffirmed the long-term vision for electricity.