

COMMENTS ON THE 2018 DRAFT IRP

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IN ORDER TO BE RELEVANT TO SA'S CHALLENGES THE IRP SHOULD TAKE INTO ACCOUNT THE SEVERE FINANCIAL CONSTRAINTS IN THE ESI

- The IRP has to relate to the enormous real world financial challenges that Eskom and the South African power sector faces in order to be of value as a practical plan. These challenges include:
 - Eskom's on-going liquidity and funding crisis;
 - Soaring Eskom primary energy and capital costs;
 - South Africa's rapidly rising electricity tariffs (Eskom and Municipalities).
 - Stagnant sales and demand;
 - Growing municipal non-payment problems;
 - A fundamental disruption of Eskom's business model caused by a technological revolution in the sector with lower cost and smaller scale renewable energy and related technologies that are already taking Eskom and municipal market shares.



ESKOM FACES THE LARGEST FINANCIAL CRISIS OF ITS EXISTENCE. BASED ON SCENARIOS OF FUTURE CASH FLOWS, ASSET VALUES ARE OVERSTATED AND A LARGE PORTION OF ITS DEBT IS STRANDED.

Impact of likely R300bn asset write-down (conservative median value)

Eskom			
Statement of financial position (Balance sheet) - Rbn			31-Mar-18
Non-current assets		658	
Current assets		72	
Non-current assets held for sale		9	
			739
Consisting of:			
Generation	72%	532	
Transmission	14%	106	
Distribution	14%	101	
TOTAL ASSETS			R739bn
Equity			170
Liabilities			569
Non-current liabilities		474	
Debt securities issued*	348		
Other	126		
Current liabilities		93	
Debt securities issued*	41		
Other	52		
Non-current liabilities held for sale		2	
TOTAL EQUITY AND LIABILITIES			R739bn
*Total debt	389		

Eskom			
Statement of financial position (Balance sheet) - Rbn			31-Mar-18
Non-current assets		358	
Current assets		72	
Non-current assets held for sale		9	
			439
Consisting of:			
Generation	53%	232	
Transmission	24%	106	
Distribution	23%	101	
TOTAL ASSETS			R439bn
Equity			0
Liabilities			439
Non-current liabilities		345	
Debt securities issued*	218		
Other	126		
Current liabilities		93	
Debt securities issued*	41		
Other	52		
Non-current liabilities held for sale		2	
TOTAL EQUITY AND LIABILITIES			R439bn
*Total debt	259		

Reduction in equity value

Distressed debt

Order of magnitude estimate. This analysis isolates the balance sheet impact on Generation assets by showing the median impact on future Generation revenues of a wide range of scenarios. Includes commitment to complete Medupi and Kusile and business as usual. In effect this assumes Eskom consists of G, T & D, and that T & D are able to recover cost reflective tariffs. Zero return on equity assumed in discount rate.



A SUITE OF DRASTIC MEASURES WILL BE REQUIRED TO AVOID AN ESKOM DEFAULT

- Drastic cost cutting.
 - Opex
 - Primary Energy (including coal)
 - Capital expenditure (new plant, lifex, environmental retrofitting, etc.)
- Additional future cost obligations must be least cost (including PPAs).
- Revenue maximisation
- Measures to reduce the cost of finance
 - Bailouts
 - Concessionary funding (including DFI and climate funding)
 - Possibly linked to additional green house gas reductions.

This is where the
IRP comes into the
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HOWEVER, THE DRAFT 2018 IRP IS NOT “LEAST COST” AND IS NOT APPROPRIATE FOR THE FINANCIAL REALITIES OF THE ESI

- It assumes a continued expensive coal power station build programme
 - This includes the two coal IPPs and the completion of Medupi and Kusile
 - Part of this coal generation capacity is not required in the immediate future (the coal IPPs will be on inflexible take-or-pay contracts) and can be provided by more economic technologies and funded by other parties when it is.
- It assumes the operation of the older coal stations for the remainder of their full 50 year lives.
 - This implies that in many cases very expensive coal supply arrangements will continue for these stations;
 - Fixed operating costs will be incurred – even if they run at lower capacity factors;
 - Capital expenditure on refurbishment and environmental compliance retrofitting will be required (only to run for short periods).
 - All of these options make the continued running of these stations expensive compared to other alternatives.
 - These incremental cost effects appear not to be adequately reflected in the draft 2018 IRP.



THE PLAN IS THEREFORE NOT WORKABLE OR CREDIBLE AND CANNOT BE FUNDED

- The draft 2018 IRP has to assume that Eskom will be able to recover its soaring costs by raising tariffs a further 69% by 2021 (or 39% in real terms assuming 5% inflation).
- Recent experience suggests that assuming such large tariff increases is now completely unrealistic.
- Despite assuming these large tariff increases the "median" IRP demand scenario still forecasts a demand growth rate of 1,8% up to 2030.
- South Africa's experience with stagnating demand since 2008 and a decoupling between electricity demand and economic growth strongly suggests that even this median demand growth assumption is unrealistic for long term planning purposes – especially in light of the large tariff increases assumed.
- The upshot of these conclusions is that the entire draft IRP is premised on a revenue plan for the industry (mostly Eskom) that is unachievable and therefore not credible. The numbers simply do not stack up – something will have to give.
- For the plan to be credible and of value to Government and South Africa, it will have to be financially realistic and fundable.



TECHNOLOGICAL DISRUPTION IS DEVASTATING COAL-BASED POWER MONOPOLIES

- The early REIPPP programme has been expensive.
 - E.g BW4: 97 c/kWh (PV) and 77 c/kWh (Wind) in 2018 ZAR.
- However, renewable and associated technologies have now fundamentally disrupted the economics of large-scale centralised coal-based power generation.
- Internationally auctions are now often pricing renewables around or below 20 \$/MWh
- This is 30 ZAR cents (15 ZAR/USD). Even with a 50% premium this is 45 c/kWh.

Coal cost (R/t)	350	400	450	500	550	600	650	700	750	800
Electricity (c/kWh)	43	45	48	51	54	56	59	62	64	67
Realistic new renewables price										
Average Eskom coal price										
Marginal Eskom coal price										
IRP assumed coal cost										

- These figures suggest that for Eskom's power stations with more expensive coal supplies it is already cheaper to procure new renewables rather than purchasing expensive coal and incur other costs to keep the older stations operating.
 - For the foreseeable future the integration costs for renewables will be very low, given the low levels of renewables penetration at present (4.5 – 5%).



BUT, LOW COST RENEWABLES NOW PRESENT A GAME CHANGING OPPORTUNITY FOR ESKOM AND SOUTH AFRICA

- Eskom, as the single buyer, will capture the financial benefits when new renewable power is procured at a price lower than the full incremental cost of running coal stations.
- Low cost renewables is now a cheaper alternative to procuring (or investing in) new expensive coal for Eskom power stations.
- This saving will assist with addressing Eskom's financial crisis.
- Over time on-going price reductions in renewables and Eskom's forecasts of on-going above inflation increases in coal costs means that this saving will only increase as the renewables programme is rolled out.
- The aim should be to maximise the opportunity for these cost savings by accelerating the decommissioning of coal plant and curtailing the construction of new coal capacity – including Kusile units 5 and 6.
- This will require a complete paradigm change in order to adjust to the fundamental technological disruption in the industry and to ensure that Eskom and South Africa can capture most of the benefits that will arise therefrom.
- Many of these comments were initially set out in (attached herewith):
<https://www.businesslive.co.za/bd/opinion/2018-09-03-energy-plans-drafters-are-stuck-in-a-coal-hole-and-have-just-kept-digging/>



THE ABSENCE OF POLITICAL LEADERSHIP ON NEGOTIATING A JUST TRANSITION FOR COAL MINING COMMUNITIES HAS OBSTRUCTED THE DEVELOPMENT OF A TRUE LEAST COST IRP

- Power station and coal mining workers and their communities have legitimate concerns relating to how the on-going transition will affect their future economic opportunities.
- These legitimate concerns have at times been “hijacked” by coal and nuclear commercial interests that resist the transition to lower cost cleaner technologies.
- The fact that this political conundrum has not been adequately addressed by politicians appears to have prevented IRP planners from running true least cost scenarios.
- It is therefore critical and urgent that Government establish a high-profile consultative process to work out a credible plan to support affected coal worker communities and facilitate their access to new economic opportunities.
- Without such a compact in place South Africa’s transition to cleaner and lower cost electricity is likely to encounter major difficulties.





Opinion

INTEGRATED RESOURCE PLAN

Energy plan’s drafters are stuck in a coal hole and have just kept digging

Eskom can save cash by procuring new renewables to displace energy from most existing power stations, writes Grové Steyn

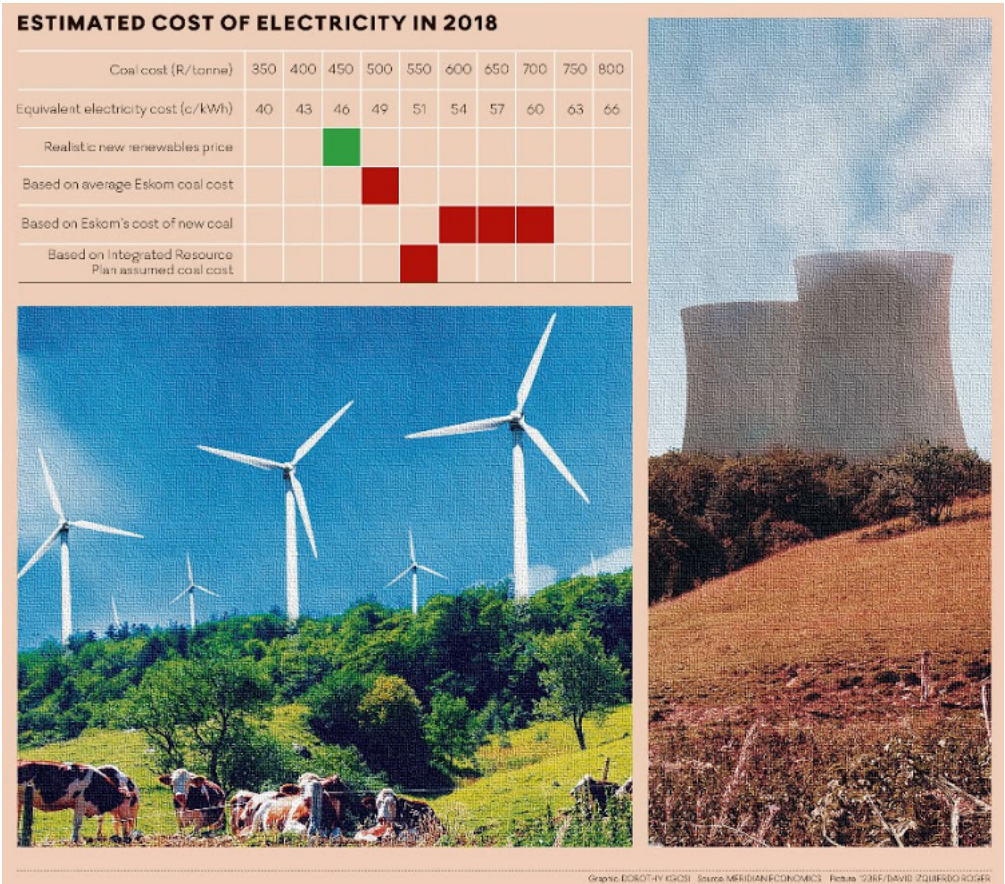
03 September 2018 - 05:04 Grové Steyn



Energy minister Jeff Radebe. Picture: SIYABULELA DUDA

The minister of energy, Jeff Radebe, published a draft of SA’s long-awaited new Integrated Resource Plan (IRP) for the power sector last week. Most observers are relieved that the draft does not include expensive nuclear power being forced into a "policy adjusted" plan with potentially disastrous financial and other consequences for SA, as was standard with the drafts produced during the Zuma years.

While we should indeed be relieved that some sanity has prevailed in the process, this is not the benchmark against which the IRP should be measured. The test is how it fares in meeting the enormous challenges we face in the electricity sector today.



The sector is bankrupt. Long delays and cost overruns in Eskom's coal-fired power station build programme have resulted in big price increases, consequent reductions in demand and ultimately in Eskom's liquidity and funding crisis.

Soaring wholesale electricity prices and institutional dysfunction are also driving a rapidly growing municipal arrears problem, which exacerbates Eskom's financial situation.

And, in a perfect storm, the sector is experiencing a fundamental technological disruption, with lower cost and smaller-scale renewable energy and related technologies that are already eating into Eskom's market share. Many experts now agree that Eskom's coal-based business model is not viable and will require large bailouts into the future.

Add to this the problem that SA is a disproportionate greenhouse gas emitter and that pollution from coal-based electricity causes thousands of deaths and harms the health of tens of thousands of citizens per year. Into this world the IRP will be born.

The draft plan, however, does not burden the reader with these unpleasant realities, which, if recognised, would have resulted in a different outcome. It assumes a continued coal power station build programme and the operation of the older coal stations for the remainder of their full 50-year lives. The result is that the plan has to assume Eskom will be able to recover these soaring costs by raising tariffs a further 39% in real terms by 2021.

Despite assuming these large tariff increases, the "median" IRP demand scenario still forecasts a demand growth rate of 1.8% up to 2030. By contrast, SA has experienced negative demand growth over the past 10 years, which was at least partly driven by Eskom's large tariff increases in recent years.

These numbers simply do not stack up. The plan is not viable — something will have to give.

The IRP cannot fix all Eskom's problems but it will have to be a central part of any strategy designed to get us out of the bind we're in.

From the Law of Holes we know that the first thing you should do if you find yourself in one is to stop digging. Unfortunately, this is not an option that appears to be open to the authors of the draft IRP. The draft makes much of the claim that there is little cost difference between the "policy adjusted" plan — its recommended option — and the "least cost" unconstrained scenario.

However, this claim does not take into account the opportunity cost of forcing in the coal build programme during the first six years for all the scenarios and similarly of forcing in the old power stations beyond the point where they become uneconomic. The "least cost" scenario is not in fact unconstrained or least cost. These points are worth further consideration.

The draft IRP uses a single average cost of coal of R558/ton to calculate the cost of power from coal-fired power stations. In reality the cost of coal to Eskom power stations varies widely from around R300/ton to R650/ton and at times up to R850/ton or higher.

A study published by Meridian Economics last year, relying on conservative assumptions, showed that Eskom could save significant costs by decommissioning its older or more expensive coal stations as soon as possible. Thus far SA has not benefited much from the large cost savings that can be achieved from renewables, but that is about to change with the government's next renewable energy independent power producers procurement round.

The implications of these numbers are staggering. Simply put, Eskom can save cash costs by procuring new renewables to displace energy from most of the existing coal-fired stations.

International renewable auctions are now often achieving prices well below \$20/MWh. At a conservative exchange rate assumption of R15/\$, this will amount to 30c (South African) per kWh. Let's assume local conditions result in a further premium of 50%, which will produce a price of 45c/kWh. Our analysis shows that this is equivalent to the cost of running an older coal-fired power station with a coal cost of R450/ton. As shown in the diagram, this is cheaper than electricity costs based on Eskom's average coal cost, newly procured coal costs or the IRP coal cost assumption.

While a suite of renewable power generators produces variable output, coal power can run around the clock (but as we have learnt over the past decade it is also not always reliable). Given the high penetration of coal power in our system, it is possible to add a substantial amount of renewable generation capacity before significant investments in backup capacity such as open-cycle gas turbines and other ancillary system services will be required.

The implications of these numbers are staggering. Simply put, Eskom can save cash costs by procuring new renewables to displace energy from most of the existing coal-fired stations. This will allow Eskom to bring forward the decommissioning of coal-fired power stations to save costs. The more expensive the coal being displaced and the larger the volumes of renewables being procured, the larger the savings will be. Any new long-term coal contracts priced above the system cost of the equivalent energy from renewables will be stranded.

The government has procured 6,422MW of capacity from renewable energy independent power producers. If we ramp up the renewables construction programme to an ambitious 2,500-3,000MW a year, our estimates show that by the time we have displaced the energy from 4,000MW of coal plants, Eskom will be saving approximately R3.4bn a year or more. A small start, but double this and Eskom can save approximately R7bn a year.

Every year the savings per MW will increase significantly as our new renewables become rapidly cheaper and coal costs increase. The beauty of this plan is that Eskom does not have to finance the new capacity — this is a critical point. On their own these numbers will not turn around Eskom's finances, but they will form an important part of a plan to stop the senseless digging.

The IRP's coal build assumptions also need to be revised. SA simply does not need new, expensive, inflexible coal-based independent power producers. Eskom made this absolutely clear at the Thabametsi and Khanyisa licence hearings. The economic rationale for these planned coal-fired stations has vanished. We should thank the developers for their effort, negotiate a severance deal and invite them to develop renewables projects.

Furthermore, given that Eskom already does not generate sufficient cash to service its debt, the stark reality is that for every rand it spends on building its own (already stranded) coal power stations, it only gets deeper into the hole and will have to be further bailed out. Eskom will have to drastically curtail its capital programme, including abandoning the completion of its power station build programme, especially Kusile power station with its more expensive coal.

An accelerated downscaling of the coal sector will of course further affect employment in affected communities. Their need for assistance should be addressed head-on by policy-makers. Larger employment opportunities will be created by a sustained renewables build programme.

The unprecedented crisis in our power sector means that we cannot approach our planning on a "business as usual basis". New thinking and drastic measures will be required to contain the fallout and to negotiate a possible international bailout on the most favourable terms for SA. The alternative will be much worse.

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