

Vantage GreenX

NERSA – Panel Discussion
Energy Price Determination Methodology

November 2022



Contents

1. How can “SA Incorporated” attract new investment into the sector?

1.1. Regulation

1.2. Timetables

1.3. Transparency

1.4. Addressing the Risks in the investment environment

2. Conclusion

1. How can “SA Incorporated” attract new investment into the sector?



How can “SA Incorporated” attract new investment into the sector?

Attracting new investment into any business sector involves creating an attractive investment climate. Some rules:

1. Strong **Regulatory** oversight (tariff structure, generation licences, wheeling rules, etc.) the regulator should provide oversight - an umbrella role over the sector
2. Set a **Timetable** and stick to it
3. Run a **Transparent** and easily understood process
4. Address any **Risks** within the investment environment to make it attractive (to the greatest extent possible)
 - i. construction risk
 - ii. country risk - political force majeure
 - iii. offtaker/buyer risk
 - iv. empowerment
 - v. sector structure

1.1. Regulatory Risk



Regulatory structures that are under NERSA's control

From an oversight perspective there are various things that NERSA has influence over:

- Who to award generation licences to:
 - The 100MW threshold for private IPPs?
 - Prioritise preferred technologies – coal, nuclear, renewables, hydro, gas?
- A level playing field? Transparent rules for Eskom, IPPs, Power Traders
- How should the regulator manage procurement processes vs unsolicited proposals
- Tariff – price determination methodologies! The subject of this webinar

1.2. Sticking to a timetable?



Sticking to a timetable

There are several occasions over the last few years where not sticking to the timetable has undermined attracting new investors into the sector:

- Refusal on the part of Eskom management during the Zuma era to sign PPA's with IPPs – starting with the Redstone CSP project (2016-2018), and then
- Delays to the IPP Office announcement of bid windows 4, 5 & 6
- Delays to the update of the IRP 2019. Despite it being a “living” document that is regularly updated, it was last published in 2019. The latest version is still in the process of being updated and the noise and the lack of transparency surrounding the update is undermining confidence in the sector as a whole
- Delays to the completion of Medupi, Kusile & Ingula.
 - A total cost of R451bn which equated to a cost overrun of R288bn
 - i.e. more than double the original contract prices,
 - 100% annual contract price escalation, and
 - negligible penalties to the contractors for late delivery

1.3. Transparency



Transparency in SA's Energy Sector is unfortunately sorely lacking!

Specific examples of where a lack of transparency is damaging the investment environment in South Africa. An examination of the “facts” follows:

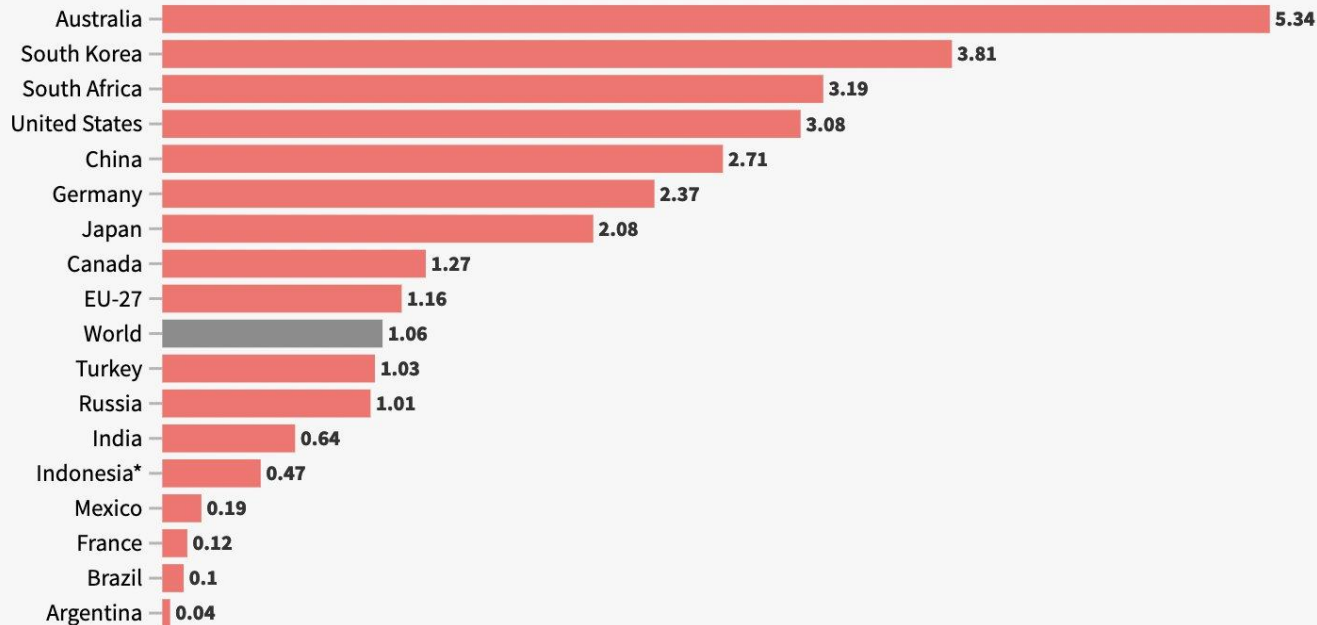
1. The true impact of climate change in South Africa and should we play “catch-up” or should we be cutting emissions like the Big Polluters from the rest of the world?
2. Is there such a thing as “clean coal”?
3. Is Europe really taking a step back to coal?
4. Is the renewable sector really trying to displace the coal sector?
5. Are renewables responsible for the significant tariff increases that SA consumers have experienced from 2008 onwards?
6. What are the IRP assumptions and how is the IRP is modelled?
7. EAF's and is it reasonable to target 75% given the age and current state of the Eskom fleet?

G20 of coal power emissions per capita. South Africa is a world leader

Coal power emissions per capita, G20

Annual average from 2015-2020, in tonnes CO2

EMBER



Source: Emissions from coal power were derived using a standard emission factor for coal generation of 900gCO2/kWh and coal generation data from Ember's Global Electricity Review 2021. Per capita values were calculated using annual population data from the United Nations. The analysis excludes G20 countries without coal generation.

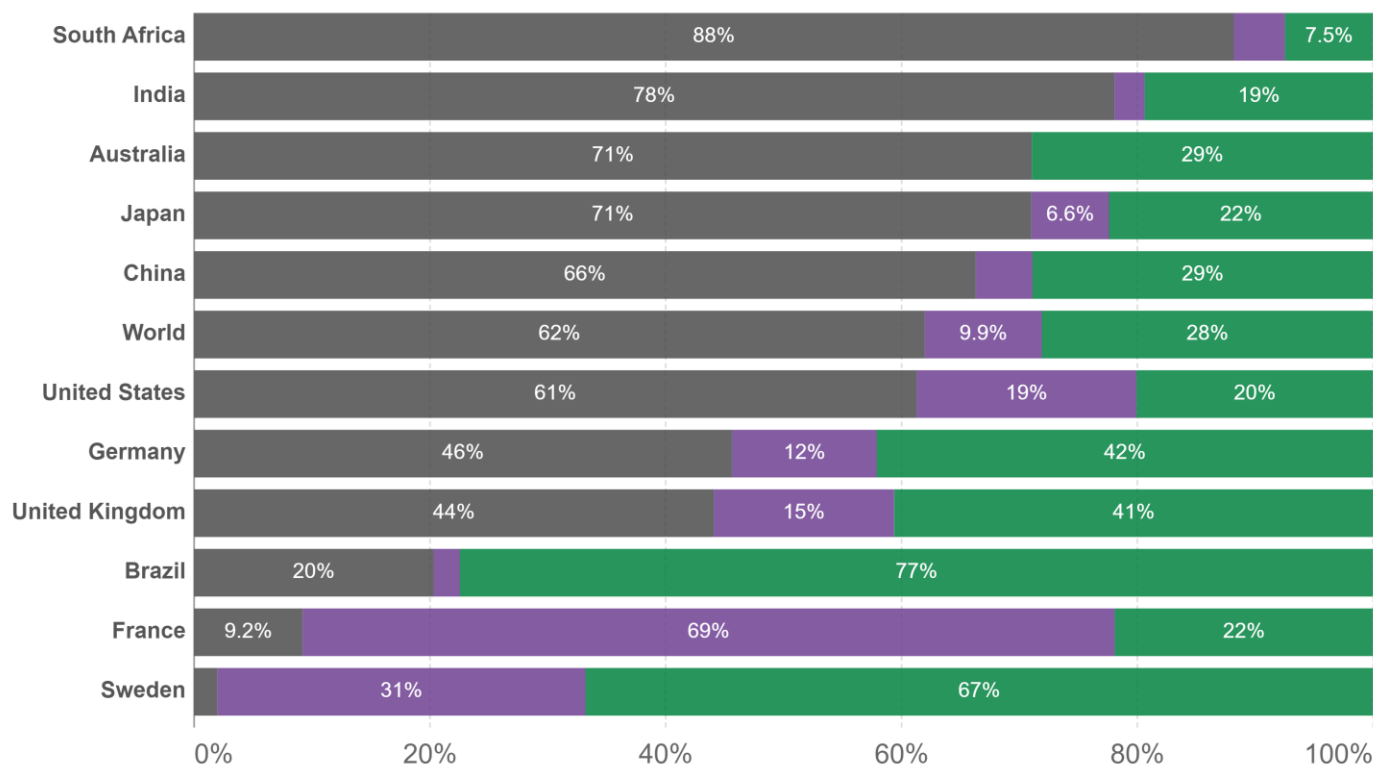
*For Indonesia, a four year average was calculated as no 2020 data was available.

Per capita MWh from various technologies

Per capita electricity from fossil fuels, nuclear and renewables, 2021

Our World
in Data

■ Fossil fuels ■ Nuclear ■ Renewables



Source: Our World in Data based on BP Statistical Review of World Energy & Ember

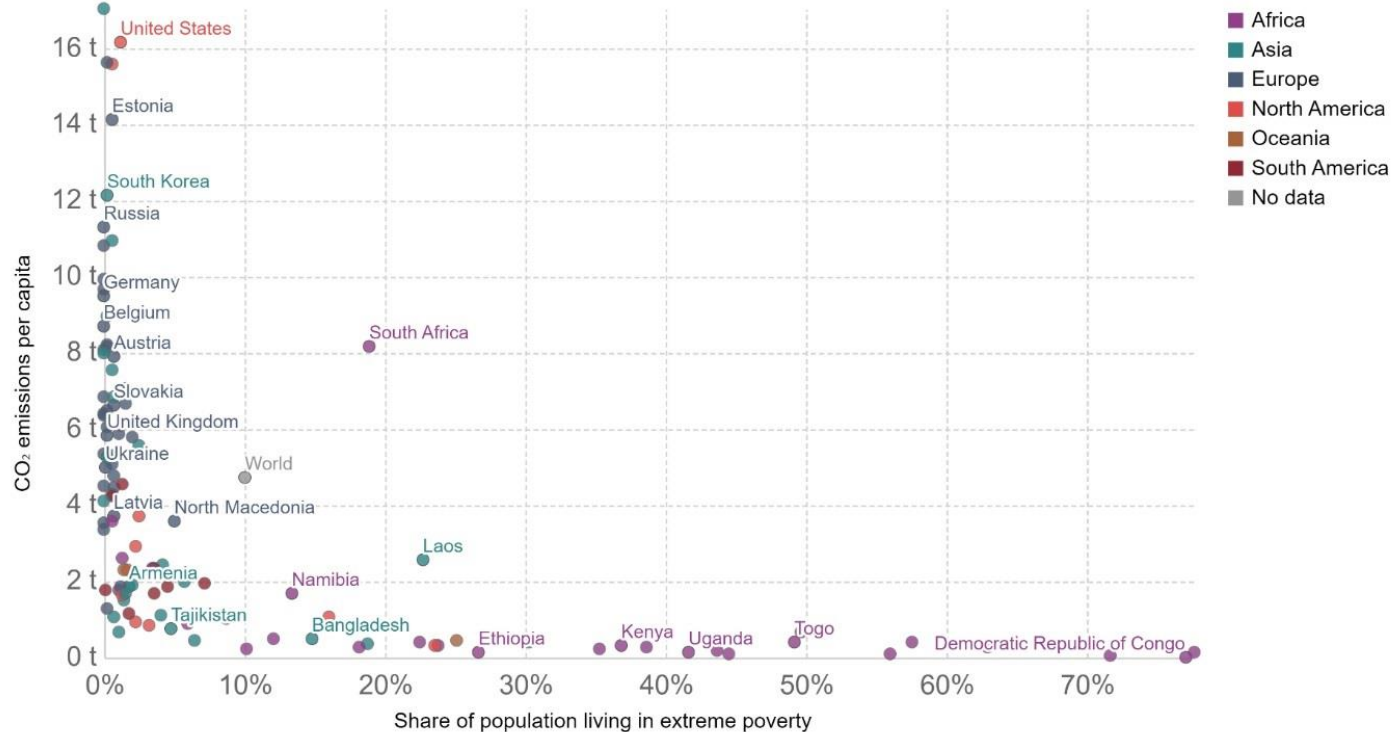
OurWorldInData.org/electricity-mix • CC BY

Should Big polluters pay up and South Africa be allowed to play catch-up (the SA COP27 mantra)?

CO₂ emissions per capita vs. share of people living in extreme poverty, 2017

Our World
in Data

Average CO₂ emissions per capita are measured in tonnes per year. Extreme poverty is defined as living at a consumption (or income) level below 1.90 "international-\$" per day. International \$ are adjusted for price differences between countries and price changes over time (inflation).

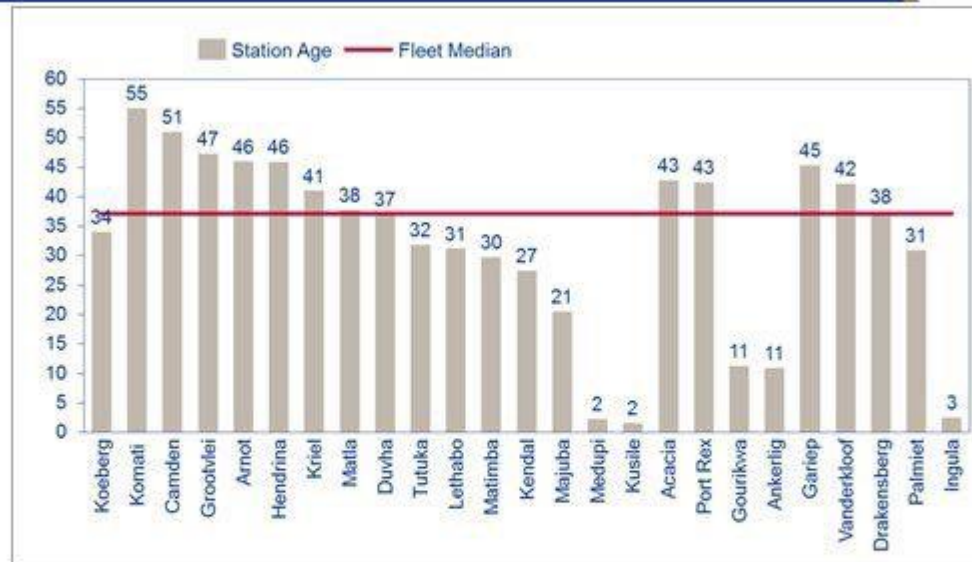


Source: Global Carbon Project; World Bank; Gapminder & UN

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY

We are running a very old fleet of power plants – is it the Renewable Energy Lobby that is driving the decision to replace them or is old age that is driving the process?

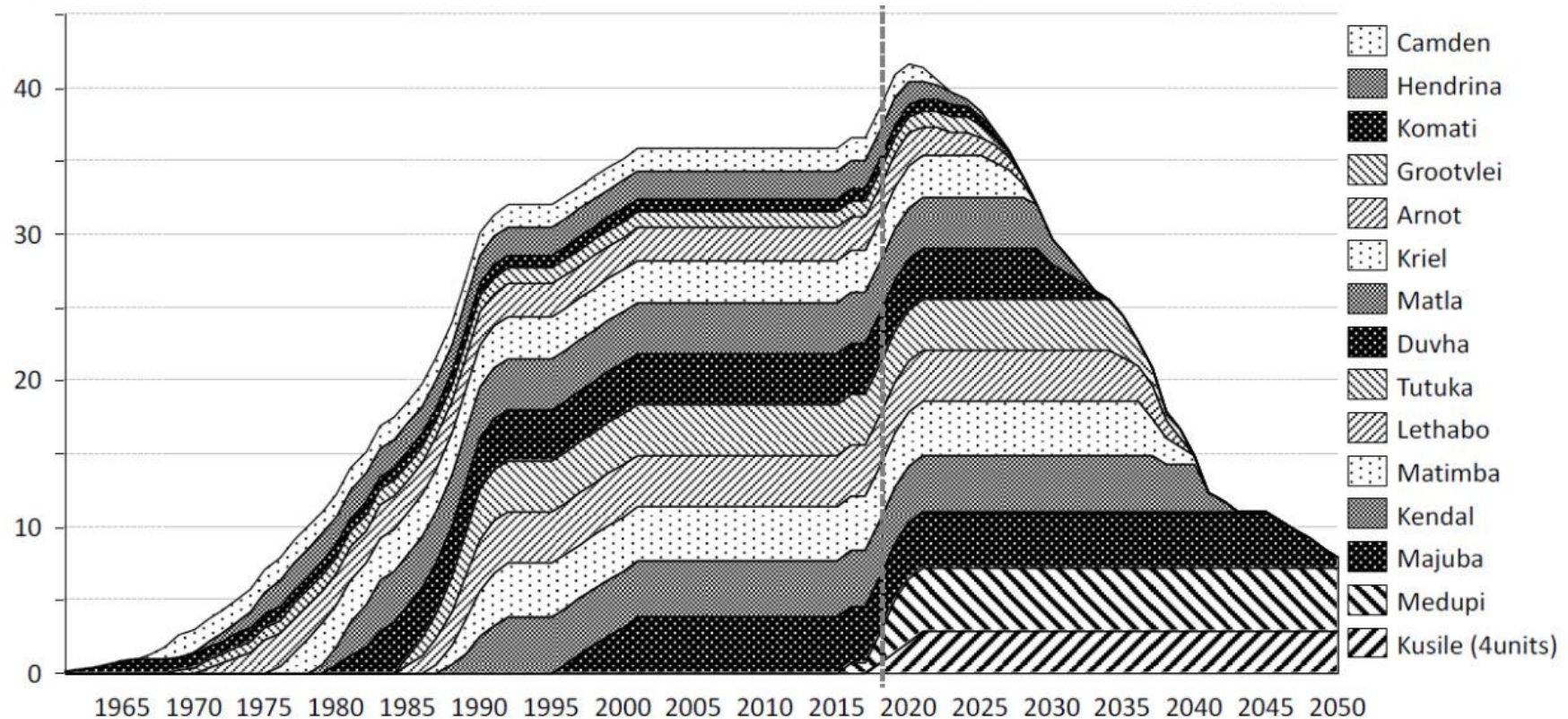
Eskom operates an ageing generation fleet



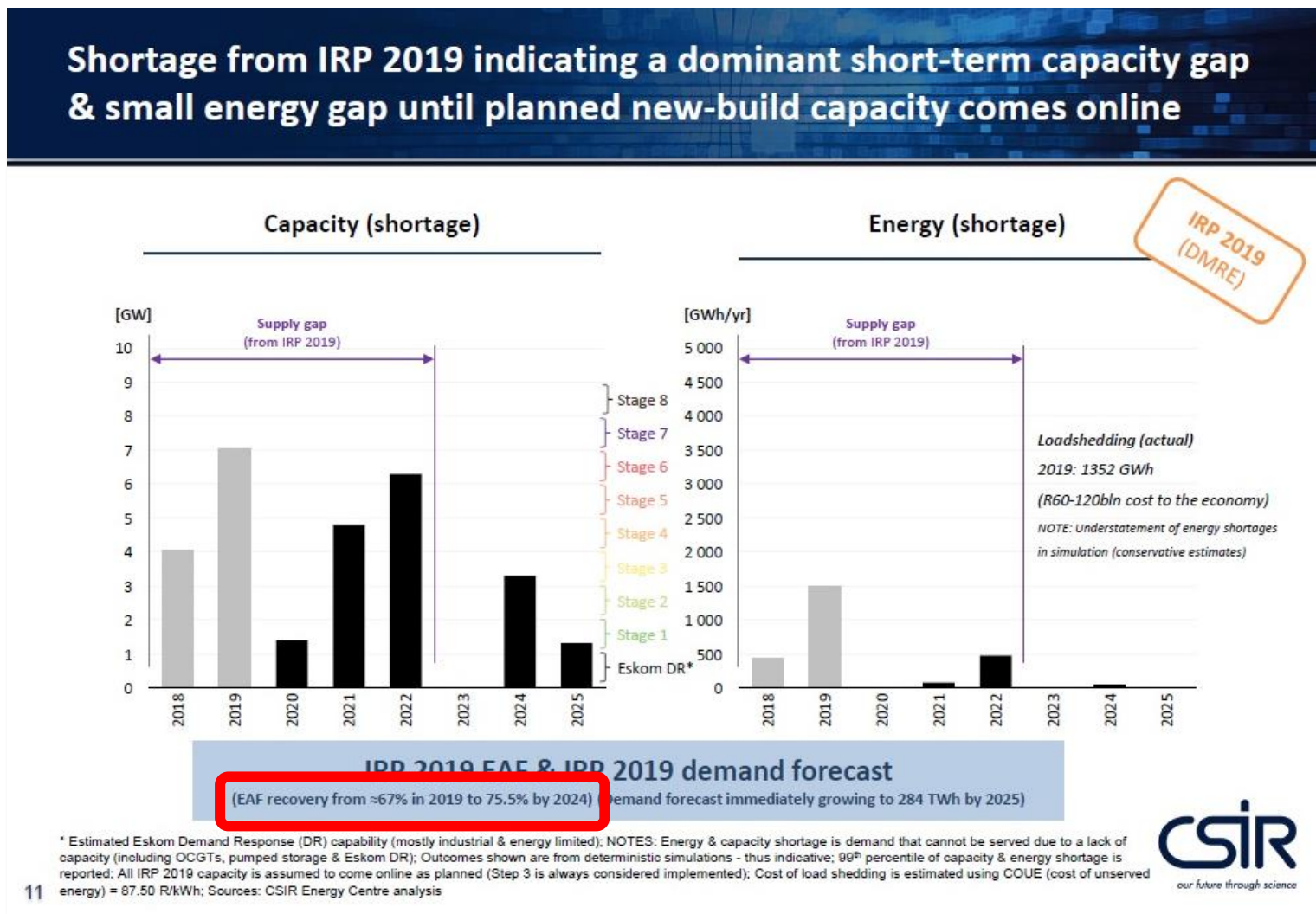
- More than half of the stations are over 37 years old
- Replacement/refurbishment of major components requires extensive outage time and is costly
- Primarily due to financial and capacity constraints, much of the refurbishment could not be executed between 2008 and 2014 as Eskom focused on keeping the lights on

The scheduled decommissioning of the Eskom coal fleet

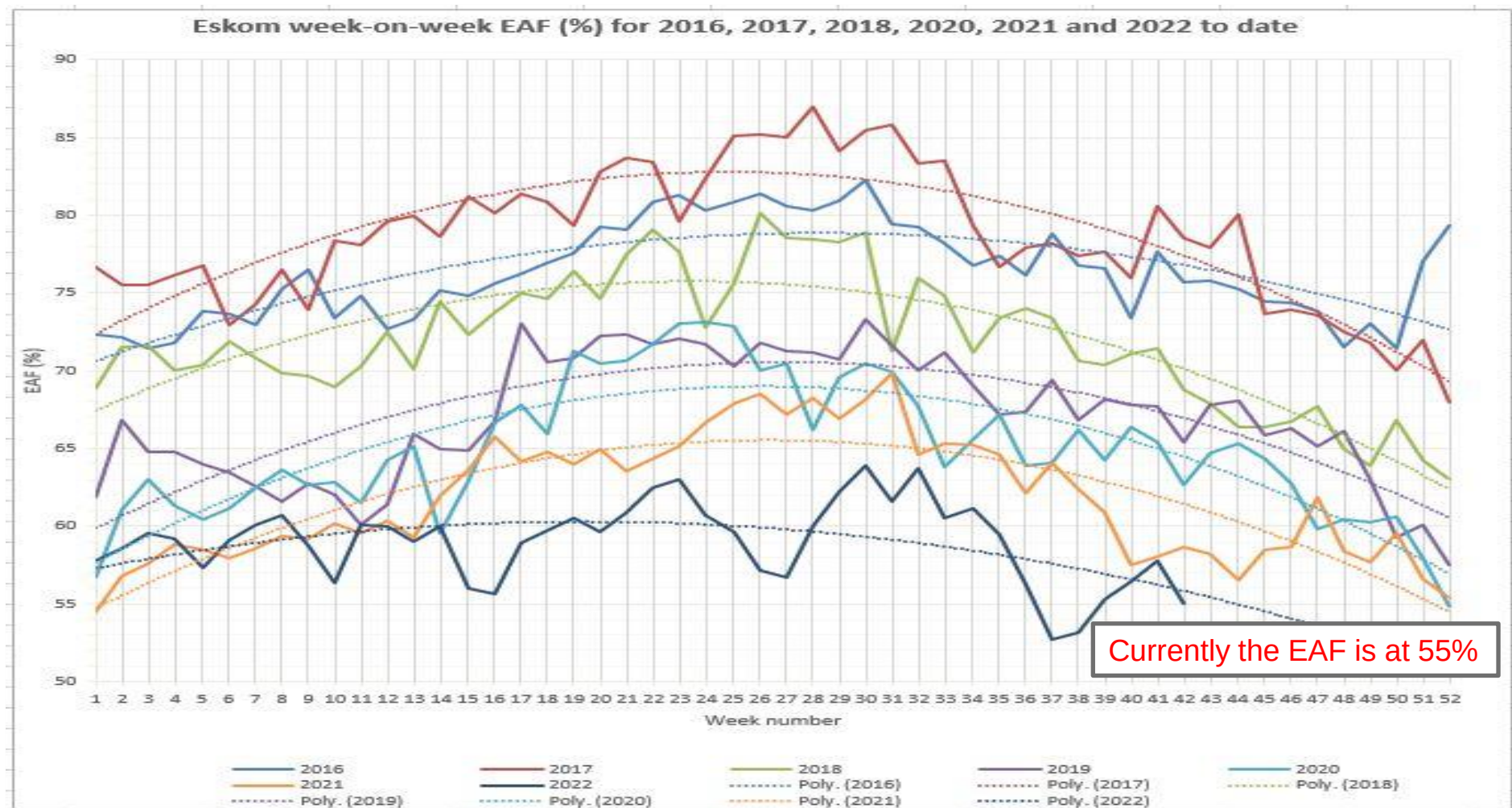
Operational coal-fired capacity in GW



IRP2019 simulations of Capacity and Energy shortages – Eskom EAF assumption

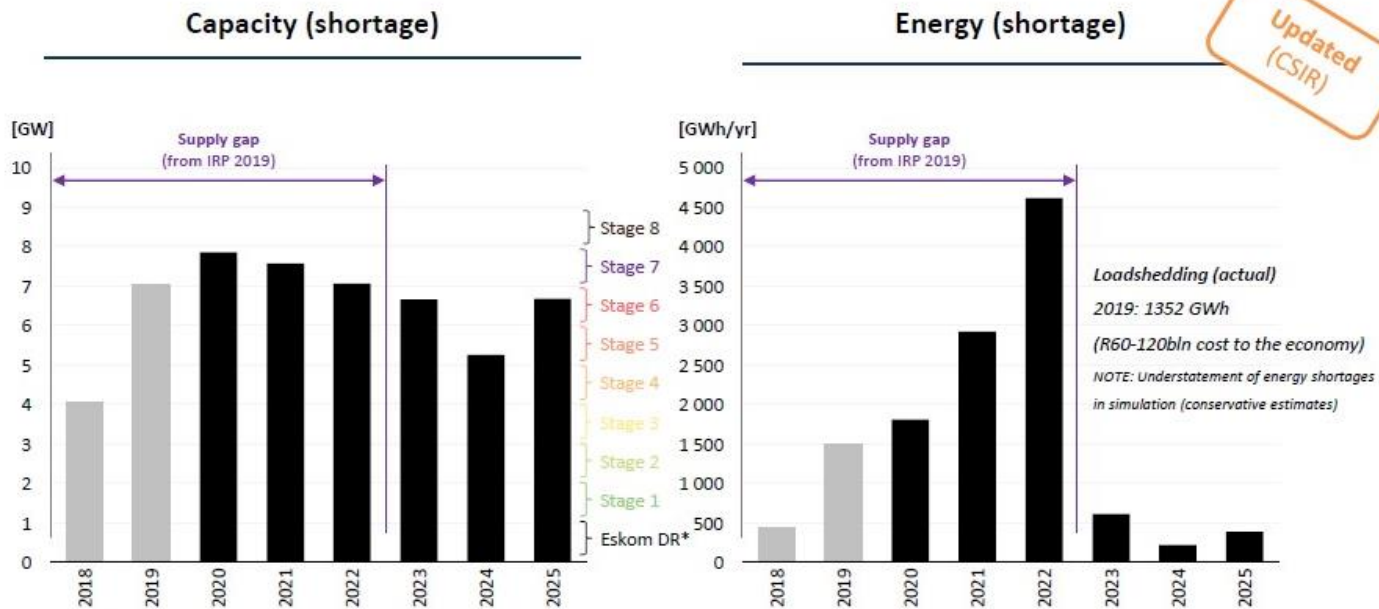


Actual Eskom EAF = week 42 of 2022



CSIR simulations of Capacity and Energy shortages – CSIR EAF assumption

Updated EAF & demand forecast indicates further shortage relative to IRP 2019 requiring capacity and significantly more energy



* Estimated Eskom Demand Response (DR) capability (mostly industrial & energy limited); NOTES: Energy & capacity shortage is demand that cannot be served due to a lack of capacity (including OCGTs, pumped storage & Eskom DR); Outcomes shown are from deterministic simulations - thus indicative; 99th percentile of capacity & energy shortage is reported; All IRP 2019 capacity is assumed to come online as planned (Step 3 is always considered implemented); Cost of load shedding is estimated using COUE (cost of unserved energy) = 87.50 R/kWh; Sources: CSIR Energy Centre analysis

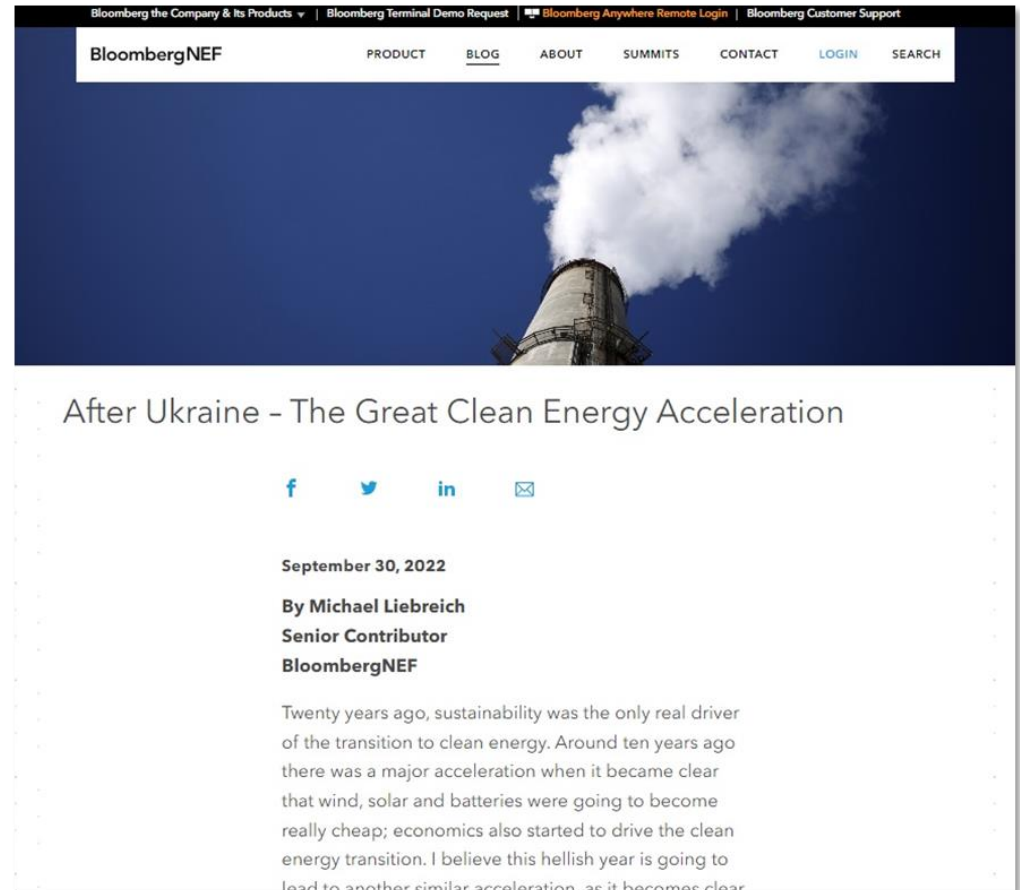
Why is the EAF relevant?

- REIPP Bid Window 6 attracted 9 666MW of interest. At an EAF of 75% SA may only need an incremental 4 200MW.
- At an EAF of 55% it may well be that SA needs an incremental 10 000MW from BW6
- Providing all the tariffs bid are competitive and providing there is sufficient grid capacity available for each, then a Special Ministerial Determination to award all 9 666MW preferred bidder status could be the right thing to do?

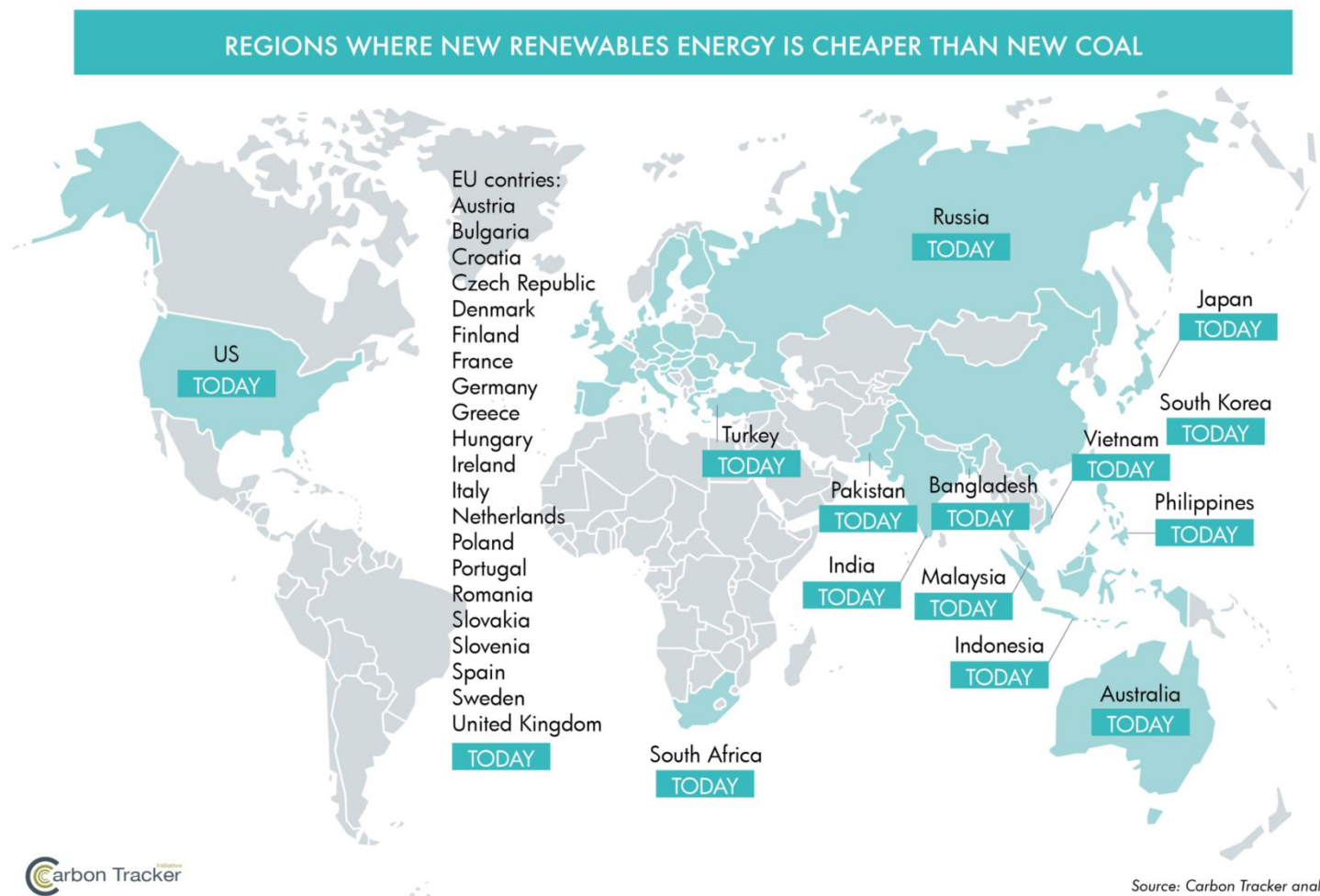
Region	PV	Wind
Western Cape	1 840	2 951
Northern Cape	610	153
Eastern Cape		1 012
Limpopo	75	
Free State	1 795	
North West	1 230	
Total MW	5 550	4 116
MW Allocation for PV	1 000	3 200
Times over-subscribed	5.55	1.29
Number of bids	33	23

Is Europe really pivoting back to Coal and is this justification for SA doing the same?

- The war in Ukraine has not prompted a long-term move back to coal, it has precipitated the temporary recommissioning of mothballed coal fired power plants and the acceleration of a move to Clean Energy.
- This is the opposite of what we are being told by SA's minister of Resources & Energy.
- The damage to the sector and the Ministers' own credibility is substantial
<https://about.bnef.com/blog/after-ukraine-the-great-clean-energy-acceleration/>

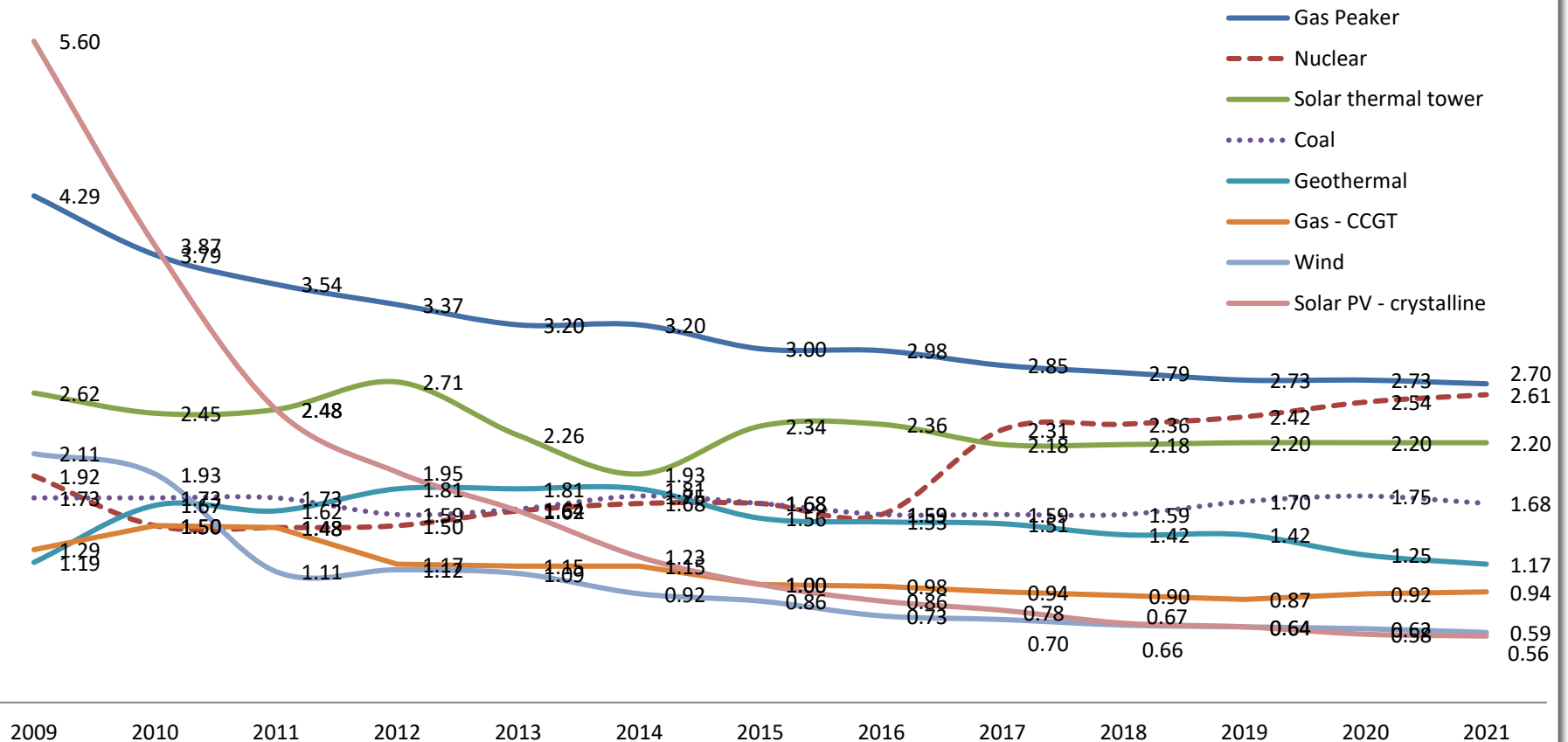


Regions where new Renewable Energy is cheaper than coal?

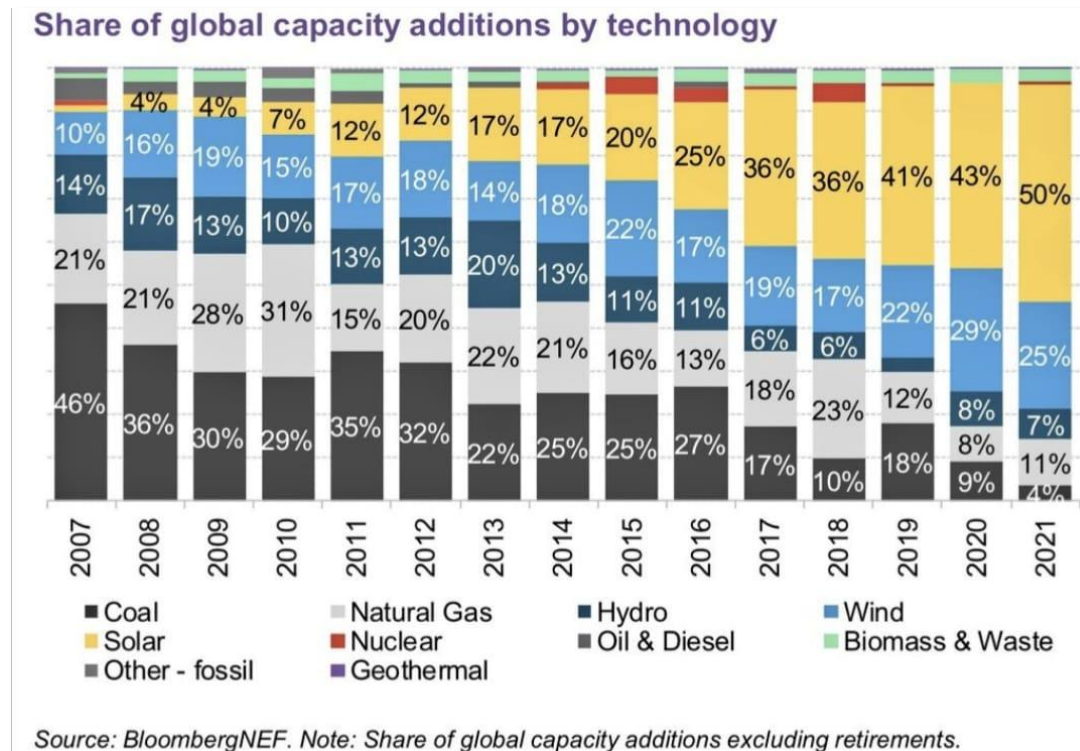


Which Technology really is the cheapest?

Lazard - LCOE analysis 2009-2021 (ZAR/kWh)

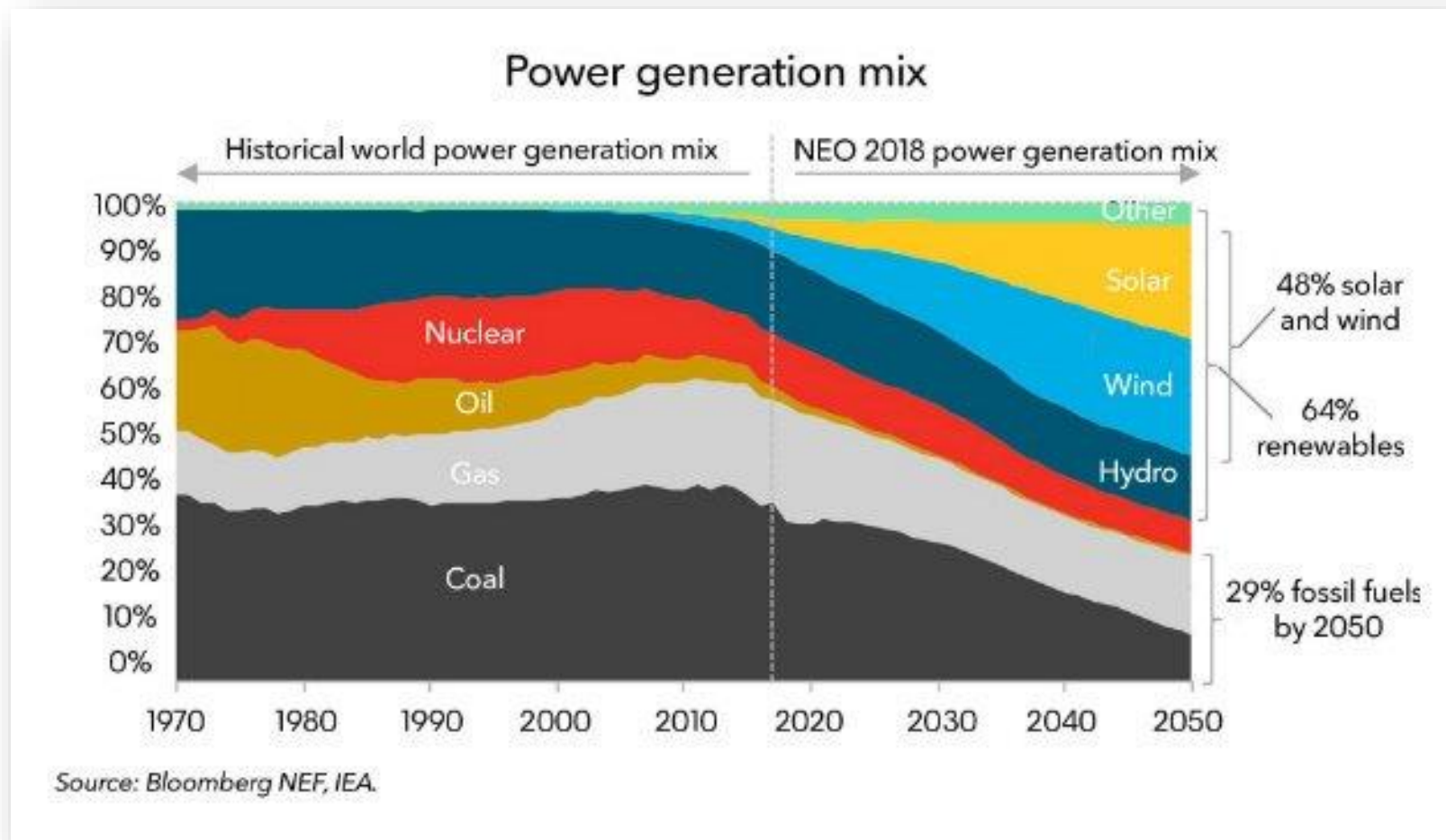


This is what is happening in the rest of the world

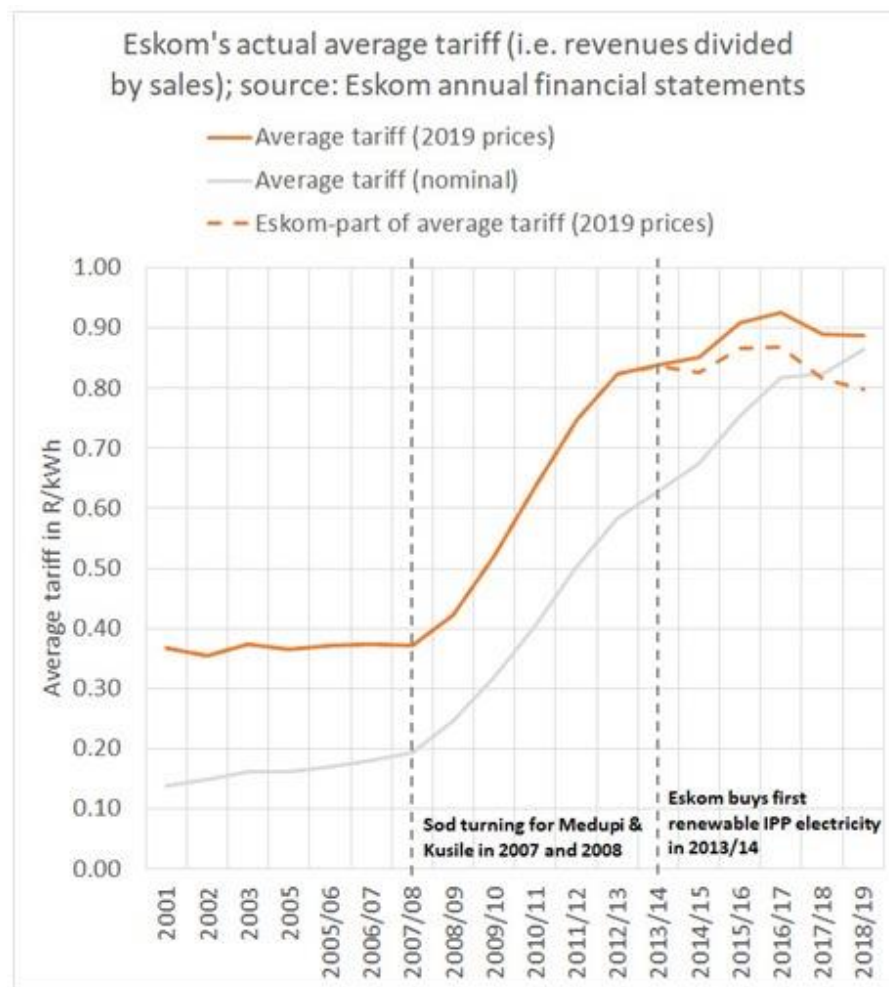


- While the rest of the world is pursuing Wind, Solar, Hydro and Biomass projects, the DMRE is heading in the opposite direction with a strategy comprising Coal, Natural Gas, Oil & Diesel and Nuclear. This strategy is not based on the economic cost of each technology.
- The recent announcements by President Ramaphosa suggest that there will be a change to this strategy
- Once the Integrated Resource Plan has been revised, it will become apparent just how much of the President's new vision Gwede Mantashe intends to implement.

Global Energy mix by 2050



It is a fallacy that Eskom tariffs have gone up since the introduction of Renewable Energy IPPs



Emerging Long-term Plan (IRP 2019)

Description	Coal	Coal (decommissioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas/ Diesel	Other (Dist. Gen)
Current Base	37 149		1 860	2 100	2 912	1 474	1 980	300	3 830	499
2019	2 155	-2 373					244	300		Allocation based on energy needs
2020	1 433	-557				114	300			
2021	1 433	-1 403				300	818			
2022	711	-844			513	1 400	1 600			
2023	750	-555				1 000	1 600			
2024			1 860				1 600		1000	500
2025						1 000	1 600			500
2026		-1 219					1 600			500
2027	750	-847					1 600		2000	500
2028		-475				1 000	1 600			500
2029		-1 694			1 575	1 000	1 600			500
2030		-1 050		2 500		1 000	1 600			500
Total installed capacity 2030 (MW)	33 364		1 860	4 600	5 000	8 288	17 742	600	6 830	4 499
% of total installed capacity (MW's)	42.62		2.38	5.88	6.39	10.59	22.66	0.77	8.72	
% of Annual production (MWh)	59.5		4.6	8.5	1.2	6.4	18.0	0.6	1.3	

	Installed capacity		Extension of Koeberg Plant Life
	Committed/Already contracted Capacity		Distributed Generation, CoGen, Biomass, Landfill
	New Additional Capacity		

1.4. Managing Risks



Specific Risks that must be mitigated/addressed in South Africa if it is to become a more attractive Investment Destination?

Risk?	Issue and how mitigated?
Construction risk	On time, on budget, to spec, cost overruns, the construction mafia?
Country risk	CNED (confiscation, nationalisation, expropriation, deprivation), riots, war & insurrection. Insurable or not?
Force Majeure	System outages – Acts of God or engineered by the System Operator?
Offtaker/buyer risk	Power sales to Eskom in its current technically insolvent state? Will National Treasury guarantees continue indefinitely? When are we going to see a stand-alone, financial independent Single Buyer Office?
Local content/ BEE rules	Notwithstanding the undeniable need for these rules, they are nonetheless an impediment to doing business in SA vs its competitors

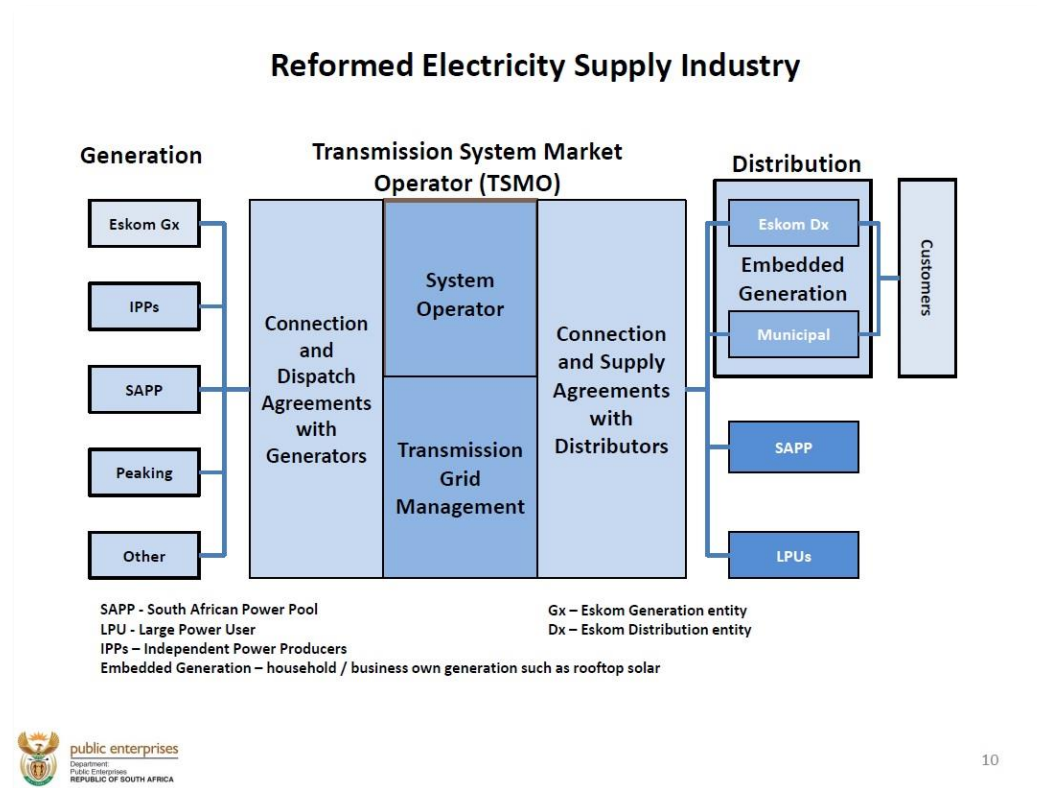
2. Conclusion



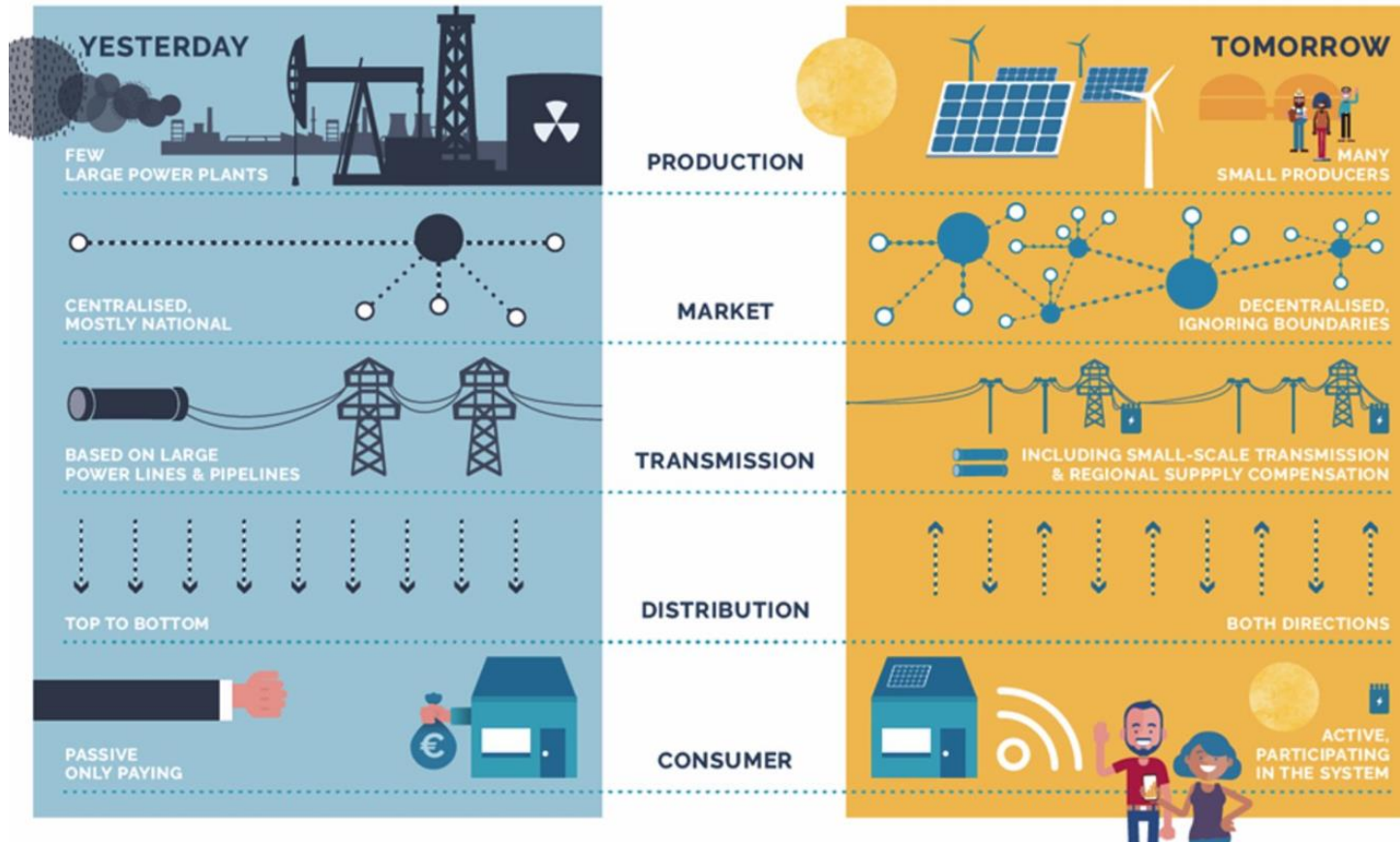
Lake Turkana – Kenya, Africa's largest wind farm

Sector Structure

A Reformed ESI will look as follows (Source: Roadmap for Eskom)



This is both the Global and the RSA future of electricity production.



This is where we are heading. How fast we get there is entirely dependent on how many new investors SA can attract by satisfactorily resolving the issues identified in the presentation?

Thank you

