ESKOM: MOVING FROM CRISIS TOWARDS A MORE SUSTAINABLE FUTURE

POWER FUTURES
SOUTH AFRICA

A resource for civil society, journalists & engaged citizens

October 2019

This booklet has been produced by the Power Futures Lab at the University of Cape Town's Graduate School of Business. It is part of the Power Futures South Africa project. Power Futures SA is a platform for inclusive, evidence-based, discussion for a just and transformed South African Energy Sector. For more information, visit **powerfutures.org** or follow the Twitter account @PowerFuturesZA.

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POWER FUTURES SOUTH AFRICA

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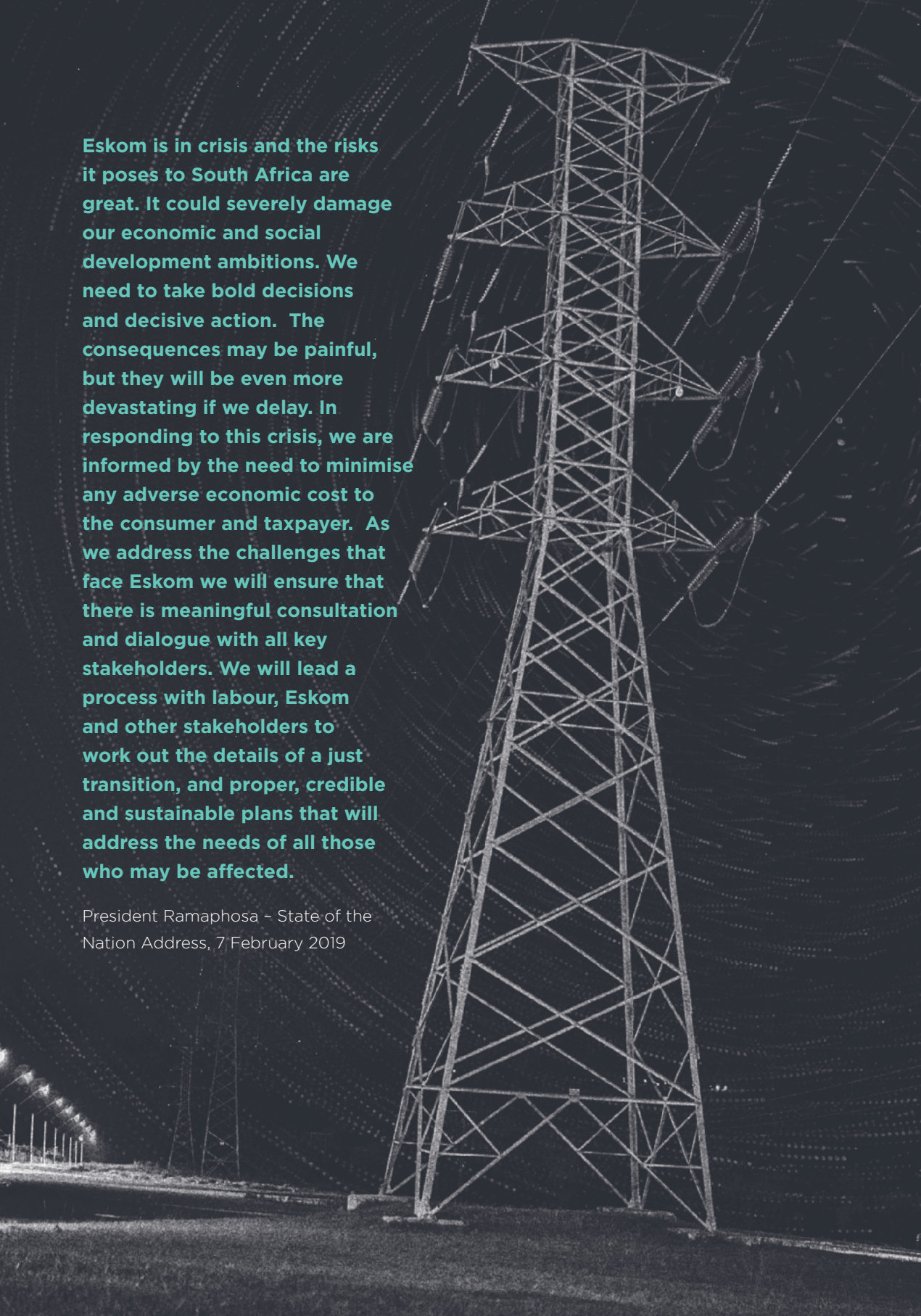


Eskom is in crisis and the risks it poses to South Africa are great. It could severely damage our economic and social development ambitions. We need to take bold decisions and decisive action. The consequences may be painful, but they will be even more devastating if we delay. In responding to this crisis, we are informed by the need to minimise any adverse economic cost to the consumer and taxpayer. As we address the challenges that face Eskom we will ensure that there is meaningful consultation and dialogue with all key stakeholders. We will lead a process with labour, Eskom and other stakeholders to work out the details of a just transition, and proper, credible and sustainable plans that will address the needs of all those who may be affected.

President Ramaphosa – State of the Nation Address, 7 February 2019

THE STATE OF ESKOM IN 2019

Ahead of South Africa's national election, at the State of the National Address (**SONA** 2019) in February, President Ramaphosa made a much-awaited pronouncement on the future of Eskom. The utility, which is in the grip of a financial and institutional crisis, is to be 'unbundled'. Minister of Finance, Tito Mboweni, provided more detail in his inaugural **budget speech** on 20 February 2019. Since then, the depth and urgency of Eskom's financial crisis has been exposed to be worse than expected, increasing the urgency of structural intervention. At the same time, many stakeholders are concerned about the details for the electricity sector's future.

Most stakeholders want South Africa's energy transition to be both just and sustainable, with universal, equitable access, and supportive of economic opportunities for all. This is not currently the case. The World Economic Forum ranked South Africa 114th out of 115 countries in terms of readiness for a sustainable energy transition. Many energy sector experts, political leaders and other key stakeholders argue that this crisis and those that came before it is the result of the systemic dysfunction of a vertically integrated monopoly. Why do these stakeholders think the problem is structural?

- Eskom's vertically integrated monopoly is uncommon by international standards. This kind of monopoly is associated with higher costs. When measured against other, unbundled sectors, Eskom's ballooning operational and capital expenditure costs over the past ten years are indeed remarkably high.
- Secondly, Eskom has blocked the entry of new players and new sustainable technologies in the sector by wielding its monopoly power to make anti-competitive decisions to stall independent power contracting processes and to undermine municipal distribution.

> "Eskom presents the biggest risk to the fiscal framework because of its financial problems and negative impact on the economy. Given the high risks of a systemic failure if Eskom were to collapse, government is urgently working on stabilizing the utility, while developing a broad strategy for its future."
>
> Finance Minister Tito Mboweni

- Thirdly, the low transparency and accountability associated with monopolies in general, and within Eskom, has created an environment where corruption and maladministration flourished. Eskom has been at the heart of South Africa's state capture story, the details of which have been exposed through the Portfolio Committee on Public Enterprises' inquiry into allegations of state capture at Eskom, as well as the 'Zondo Commission'.

THE ESKOM CRISIS: HOW BAD IS IT REALLY?

Eskom's current debt and looming insolvency is a threat to the South African state. In his Budget Vote address on 11 July 2019, Finance Minister Tito Mboweni, stated: "Eskom presents the biggest risk to the fiscal framework because of its financial problems and negative impact on the economy. Given the high risks of a systemic failure if Eskom were to collapse, government is urgently working on stabilizing the utility, while developing a broad strategy for its future."

Despite what are already unaffordable electricity tariffs for many South Africans, as well as worryingly large government bailouts, already approaching a hundred billion rands, it is unlikely that these measures will be able to plug the holes in the public utility. Key facts about Eskom's current crisis include:

- Eskom's costs are greater than its revenues. For the 2019 financial year, the State Owned Company's (SOC) pre-tax losses were R29 billion. This is the largest loss for an SOC, on record in South Africa. It is unable to cover fully its operational (including salaries) and capital costs (refurbishment and completion of power stations).
- Eskom's debt stands at approximately R450 billion, in August 2019.
- Eskom is currently taking on debt to service its debt. It is generating less than half of the cash it needs to service its debt, including principal repayments, as well as interest on those principal amounts. Eskom's current debt service coverage ratio stands at 0,47.
- Parliament passed an Eskom Special Appropriation Bill, allocating R26 billion in the 2019/20 financial year, and R33-billion for the 2020/21 financial year, in addition to R23 billion allocated by the Minister of Finance in February 2019.

The scale of Eskom's required bailouts is alarming, given that the consolidated national budget deficit for the 2019/20 financial year was forecast by National Treasury at 6% of gross domestic product (GDP) and the total sovereign debt was forecast at 56.1% of GDP. However, South Africa is expected to exceed both these forecasts. Consequently, the prospect of a credit downgrade is very real.

While a credit downgrade may seem rather abstract for many South Africans, the impacts will be concrete, significant and directly affecting everyone. A credit rating downgrade means that South Africa is seen as a riskier loan recipient (our risk of defaulting is perceived as relatively high). This means that lenders will only offer loans at higher interest

rates, increasing the cost of borrowing. This means that more money goes to repaying debt, which leaves less money for all of our urgent development priorities, including spending on infrastructure, education, healthcare, social grants, etc.

- While the impact of a downgrade immediately affects the government budget, **research suggests** that banks' and corporations' credit ratings are impacted by sovereign ratings. If companies pay more for debt, they will charge more to customers to recover these costs. This is not what is needed to broaden access to goods and services, nor to achieve the economic growth targeted through the National Development Plan.

In addition to Eskom's debt, issues reported in the latest Integrated Report include[1]:

- Plant availability dropped below 70% and, following two years without, national load shedding commenced again during the 2018/19 financial year
- Municipal arears debt (non-payment for electricity bought from Eskom) stood at R19.9 billion. If we include Soweto, the total arrears now approach R40 billion.
- Investigations into state capture, fraud and corruption continued, with several irregular supplier contracts terminated, and irregular expenditure of R6.6 billion identified (20% from new transgressions)
- Environmental performance of coal-fired power plants is non-compliant with legislative standards and is resulting in premature deaths
- The Medupi and Kusile coal-fired power plants remain uncompleted and are currently assumed to cost at least double original budgets. These projects are significant drivers of Eskom's climbing debt levels.

Table 1: Eskom's growing costs and inefficiencies[1]

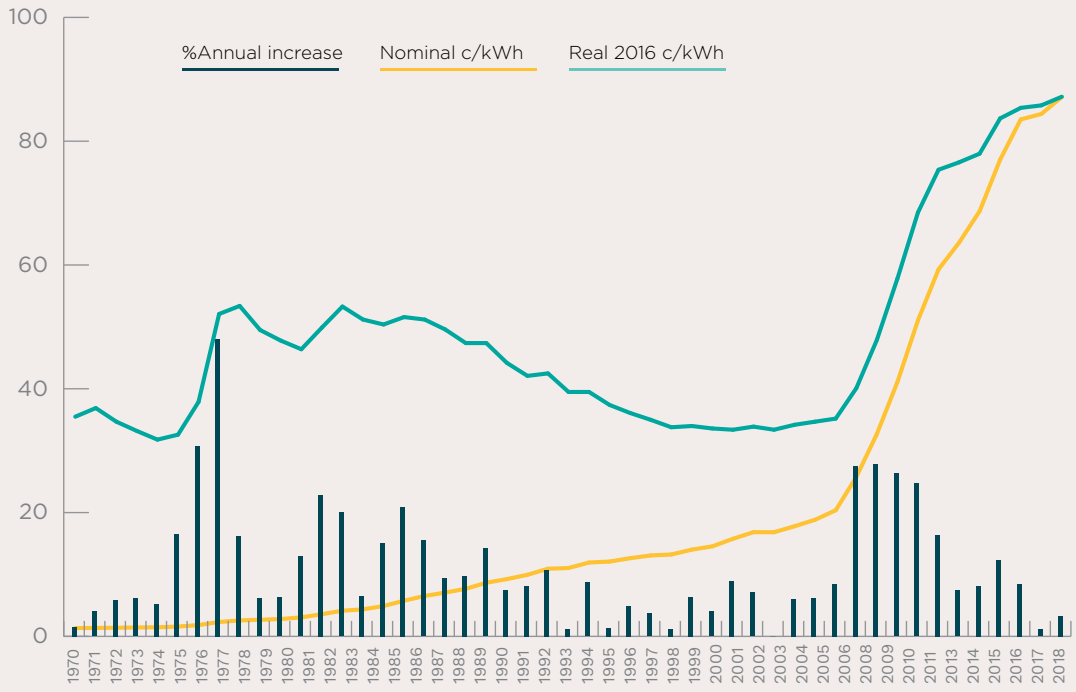
Cost categories	2007	2017	2019
Total installed capacity (MW)	42,618	44,134	44,172
Electricity sales (GWh)	218,120	214,121	208,319
Revenue (R millions)	39,389	177,136	179,892
Average selling price (c/kWh)	18	83.6	86.4
Coal purchases (Mt)	117.4	120.3	113.8
Coal costs (R millions)	+/- 10 000	50,300	58,500
Employee costs (R millions)	9,451	33,178	33,272
Employee numbers	32,674	47,658	46,665
Debt securities & borrowings (R millions)	40,455	355,300	440,610

Eskom's financial problems demand urgent intervention. As things stand, to addresses these operational and financial issues, Eskom can try to:

- **Raise electricity tariffs,** but with almost half of the adult population living below the national poverty line, the country cannot afford to keep absorbing tariff increases, which have risen more than four times (nominal) and nearly three time since 2006 (real) (see below). Also as tariffs increase, consumers use less and Eskom doesn't get the revenue it needs.
- **Raise more debt,** but lenders are now wary and the level of state support required is completely unsustainable, as well as financially and economically devastating for South Africa.
- **Attempt to recuperate debt owed to Eskom by financially struggling municipalities**

These measures are not only difficult to implement, they are also inadequate to deal with the crisis. The restructuring announced by the President is an acknowledgement of the seriousness of the situation. The most serious financial risks are in its generation business. These risks need to be contained and stranded assets dealt with. Ring-fencing the risky parts of the company would also allow for a debt-restructuring deal without infecting the entire system.

Figure 1: Eskom tariffs from 1970 to 2017



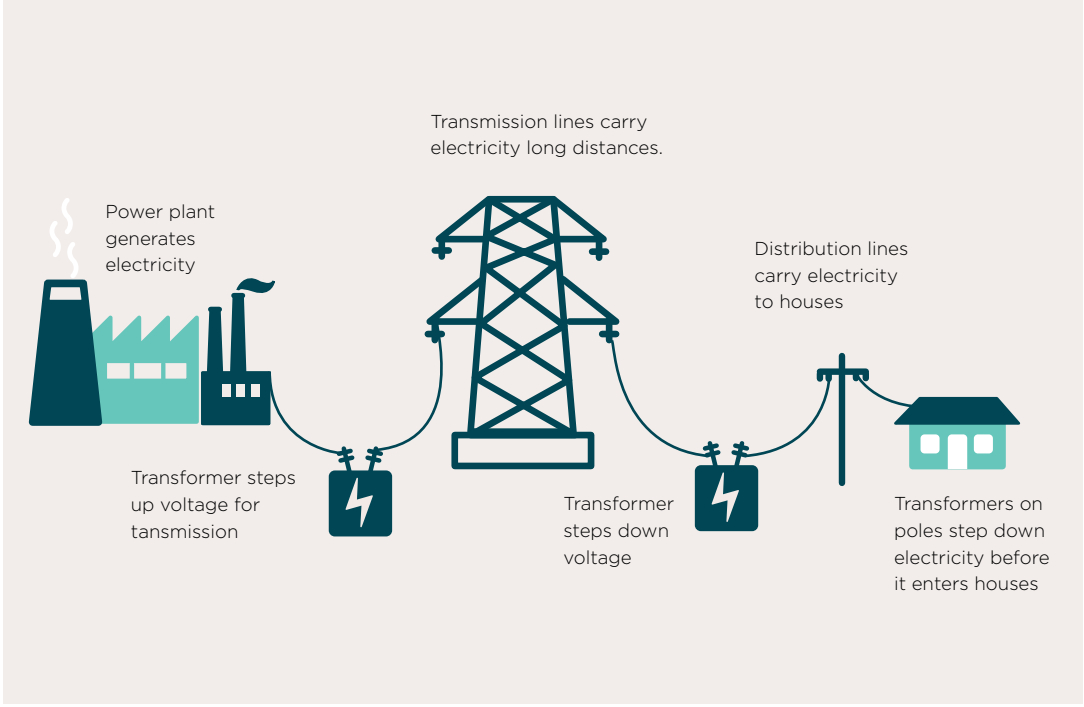
HOW DID WE GET HERE?

ESKOM'S MONOPLY IS BEHIND THE TIMES

"At a strategic level, we must thus face the reality that a large, vertically integrated energy company is an outdated model in a changing industry, both domestically and internationally." – Finance Minister, Tito Mboweni

Eskom's problems are structural and historical. In its current form, Eskom is too big to manage effectively. Eskom was set up in the past century to drive industrialisation in apartheid South Africa. Reliant on the country's plentiful coal, the entity's monopoly structure was useful in pursuing ever-larger economies of scale in the size and output of power stations. In other words, bigger power stations were better, leading to cheaper electricity.

Figure 2: Electricity generation, transmission and distribution



As the size of power stations grew, so too did the finance required to finance these capital projects. Vertically integrated power utilities, like Eskom in South Africa, control generation, transmission, distribution and retail functions in the electricity system, as shown below.

Managing a system dependent on large infrastructure, including coal, large hydro-energy and nuclear power plants, effectively necessitated state support to mobilize financing . For this reason, during this time period, vertically integrated monopolies like Eskom were common in the period up to the 1980s and 1990s.

In the 1980s, however, things began to shift. Eskom abused its dominant position (or monopoly power) and proved difficult to govern. The scale and complexity of Eskom led to several issues, the consequences of which are still visible today:

- A resistance to oversight as Eskom was largely shielded from outside interrogation
- A lack of transparency
- Corruption and mismanagement
- Excessive staffing and political patronage
- Cycles of load shedding followed by over-building and surplus capacity
- Cost overruns

The problems at Eskom were also evident in other large, vertically integrated state-owned utilities around the world. As central power stations became bigger and bigger, there were fewer economies of scale and megaprojects became more difficult to manage effectively. Indeed, cost and time overruns in building large power stations became the norm. At the same time, understanding grew that competition is possible, especially in smaller, more incremental generation technologies such as gas turbines, which are more easily privately financed. Innovations in ICT also allowed effective coordination and control of the electricity supply industry, even where there are multiple actors.

By early 1990s, the electricity sector was no longer considered a natural monopoly, which meant it was seen as possible to have competition in generation and in customer choice. A new market-oriented model (the standard reform model) was becoming international best practice, leading to a wave of power sectors reforms through the 2000s. Many countries adopted reforms that were designed to address the issues of the old monopoly structure. These reforms, which included restructuring sectors (unbundling of generation, transmission and distribution) aimed to increase transparency and competition, improve regulation, allow for new sources of investment, and support adoption of new technologies. However, while most power sectors were unbundled into smaller, competitive entities, Eskom has retained its outdated vertically-integrated, monopoly structure, restricting competition and increasing costs and inefficiencies.

DECENTRALISATION IS HASTENING A POTENTIAL DEATH SPIRAL

Internationally, the global energy transition is transforming sectors, making smaller renewable energy technology not only viable, but increasingly competitive. This bottom-up innovation is leading to what is being called "utility death spirals", in which large utilities like Eskom struggle to cover their costs as consumers use less and switch to their own generation. As electricity consumption declines, Eskom tries to get prices up to sustain its revenues, but this leads to consumers using less and even defecting from the grid, hastening the demise of the utility.

While Eskom's structure, may have been appropriate for the previous century, when large resources had to be mobilised by the state to support ever-larger economies of scale in mega power stations, this is no longer the case. Eskom's electricity oversupply allowed for rapid electrification of South Africans after the end of apartheid. Residential connections rose from just 36% to about 87% in 2019. But Eskom's performance is not serving South Africa any longer. Innovations in technology options and finance mean those economies of scale no longer apply.

Eskom has been slow to invest in renewable energy (wind and solar). At a time when the rest of the world is moving to cleaner, more flexible technologies, Eskom invested in two mega-projects, Medupi and Kusile. As some of the world's largest coal-fired power stations, Medupi and Kusile are also misaligned with global and local climate change mitigation commitments. Communities in Mpumalanga, where most of Eskom's power plants are stationed, will continue to pay the most direct costs for their operation, with pollution reaching devastating levels and undermining human health and wellbeing.

Eskom's executives undermined the former Department of Energy's (DOE) Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) by blocking the signing of the latest and lowest-cost agreements with Independent Power Producers (IPPs). Eskom's inertia has also prevented a host of other actors (municipalities, SMMEs, communities) from participating in new forms of energy generation made possible with the improvement of distributed energy resources (DERs). Instead of embracing the energy transition, past executives have sustained an expensive and dirty coal sector, including incidences of corrupt contracting. In so doing, they are delaying the development of a plan to prepare the most vulnerable for inevitable change for the necessary and inevitable transition away from coal.

South Africa has world class renewable resources that are accessible across the country. Some coal fired power stations are already obsolete, and a number, which are more than 50 years old, will need to be decommissioned in the next 10 years – they are simply too expensive to refurbish or operate. We have no choice, but to plan to escape the Eskom death spiral and embrace the enormous new opportunities available to us.

ESKOM CAPTURED

In 2019, it is becoming increasingly apparent that Eskom's vast monopoly structure has become unaccountable to oversight structures, and to the people of South Africa that it is meant to serve. It is not surprising that Eskom is at the centre of revelations on state capture at Parliament, through the Portfolio Committee on Public Enterprises' Inquiry in Allegation of State Capture at Eskom ("Eskom Inquiry"), and the Commission of Inquiry into State Capture ("Zondo Commission"). State capture first entered the national public discourse in November 2016. Former Public Protector, Thuli Madonsela, released the State of Capture report, which provided the first legal analysis of systemic corruption at SOCs[2]. Eskom's irregular dealings with the Gupta-owned Tegeta through the sale of Optimum Coal Holdings was at the centre of findings.

What became clear was that this transaction was just one manifestation of the activities of a network of corrupt actors acting together to systematically extract resources and reshape Eskom and the country's energy policy to support the accumulation of economic and political gains. The Eskom Inquiry confirmed Madonsela's findings, stating:

The Committee heard evidence which illustrated the extent to which public procurement processes at Eskom and the exercise of public power had been used to serve the interests of private businesses and individuals. The abuse of public resources to benefit these private interests stands in direct contradiction to Eskom's constitutional obligation to ensure that its procurement processes are equitable, transparent, fair, competitive and cost-effective. The Eskom Board failed dismally in its responsibility to ensure that Eskom complied with the applicable laws and SCM processes…

Additionally, as with many large monopolies, accountability and oversight of Eskom have been proven incredibly challenging, if not impossible.

The Committee finds that from about 2011, Eskom's Board failed to maintain clear lines of responsibility and accountability. Board members were allowed to interfere in the business of management (especially through the seemingly unbounded mandate of the Board Tender Committee - BTC), and often usurped the roles of group executives…

The Committee notes the many examples of institutional and oversight failure that have allowed private interests to benefit unduly from business with Eskom over the past decade with great concern. It is disconcerting that it seems the relevant authorities have not yet acted, in light of the allegations that have been brought to their through disclosures, the press, the courts, Auditor General and Parliament.

"The Committee notes the many examples of institutional and oversight failure that have allowed private interests to benefit unduly from business with Eskom over the past decade with great concern" – Eskom Inquiry

PRIVATE INTERESTS EXPLOITING ESKOM'S MONOPOLY POWER

There is a lot of concern among various stakeholders about the privatisation of Eskom. Ownership is an important policy issue that should reflect the politics and policy of South Africa. What this debate sometimes misses is the fact that the sector has always functioned to allow powerful vested interests to exploit Eskom's massive procurement spending to extract public resources to build up enormous private wealth through rent-seeking and corruption. This was true under apartheid, and it has been true during this recent period of state capture.

In August 2019, Eskom's irregular expenditure was noted by its auditors as R6.60billion. While the company has been investigating these "procurement breaches", it has not been able to stop them. Several employees have been implicated in malfeasance , sometimes benefitting directly from companies that do business with the utility.

What is clear is that, as things stand, the lines between public and private are blurred. Networks of actors operating across these spheres have colluded. Private sector companies have exploited Eskom's massive centralised procurement, as stated by the Eskom Inquiry:

According to Eskom's Procurement Policy, Clause 3.5 - 3.6, the Board delegated significant centralised power to the group executive: Technology and Commercial, with authority for all approvals related to procurement and supply chain management ("SCM") activities.

There are many roles that the private sector can play, but the current situation is not sustainable. Whatever the role that the private sector plays in South Africa's just and sustainable energy transition, it must:

- Allow for least-cost power procurement so that consumers do not pay more for electricity
- Diversify generation and reduce risks associated with overdependence on Eskom's current aging coal-fired generation
- While privately funded and operated electricity options could be introduced alongside Eskom generation, the electricity transmission and distribution sectors tend to be natural monopolies and should remain in public ownership.
- Increase transparency and accountability in the sector
- There is an opportunity to look to other countries that have already introduced various forms of private sector energy generation for innovative solutions that fit our local context.

AN OVERVIEW OF SOUTH AFRICA'S POWER SECTOR REFORM

The **1998 White Paper on Energy Policy** was the first official national policy that proposed extensive reform of the electricity sector, which included unbundling, competition and private sector participation [3]. Since then, there have been other policies, programmes and legislation to drive renewable energy and new investment in electricity generation. However, this process of reform has been undermined by:

- Vested interests seeking to protect the economic or political power that they have in the current sector.
- Stakeholders with valid concerns about what South Africa's energy future is going to look like at the end of the process.

The White Paper aimed to modernise the energy sector, transforming it into something more fitting to a democratic political context, and able to respond to new technology options, building resilience in the system to support the economic growth that national policy was targeting. However, there was not adequate understanding of the political complexities of implementation. The broad reforms were opposed by the municipal governments, labour and other stakeholders. While there have been some gains, there has been a significant opportunity cost to not acting to transform the sector for the last two decades.

THE OPPORTUNITY COST OF FRUSTRATED REFORMS:

A lack of transparency and democratisation of the energy in South Africa

South Africa's fraught, contested policy landscape has left the sector untransformed and ill-suited to democracy. The Integrated Resource Plan (IRP) was one of the outcomes of the earlier reform attempt. This plan was the result of transferring energy planning out of Eskom's unaccountable monopoly structure, and subjecting proposed electricity generation investments to public comment.

The 2010 IRP was the first plan to introduce renewable energy technologies in the form of utility-scale solar and wind. Various updates to the plan in 2013, 2016 and 2018 were unfortunately never finalised or officially gazetted This means that for a significant period of time, South Africa's electricity sector has been without a relevant, credible, up to date electricity plan. Finally, in October 2019, government approved an updated IRP.

It has also meant that many of the procurement issues related to state capture

in the sector have not been formally interrogated from the view of overall energy planning. Debates surrounding South Africa's technology choices, notably, controversial nuclear procurement, but also coal, gas, and renewables, have all happened in a vacuum of coherent research and planning. Additionally, Eskom's apparent electricity supply crisis and inability to finance electricity sector development have also unfolded without a politically and economically viable plan for the future.

Unexploited renewable energy resources

Historically (and presently), the bulk of South Africa's primary baseload supply has been generated from coal, in the form of largely stated-owned coal power plants. However, following the release of the IRP 2019, the role of coal in South Africa's capacity mix is envisaged to reduce over time. Instead, the IRP 2019 makes good on South Africa's policy commitments to transition to greater use of renewable energy sources such as wind and solar. The rationale for investing in renewable energy has two main components:

1. Renewable energy can replace fossil fuels that contribute to global climate change, as well as a range of risks, including local air and water pollution, and human health impacts for people working in coal mines, and people living near power plants.

2. Renewable energy costs are decreasing year on year.[4] While early renewable energy IPPs (REIPPs) were expensive, costs of wind energy have decreased more than 50% since 2011 and for solar, by more than 80%. The 4th REIPP bid round delivered prices at close to grid parity costs and, based on the continued fall in renewable energy auction prices globally, the next REIPP bid round will deliver prices less than half Eskom's average cost of supply.

Presently, renewable energies and gas have proved to be the most affordable power generation options, outperforming new coal or nuclear. This 2019 IRP envisaged additional

Table 2: Average tariffs offered by solar PV and onshore wind projects over bid windows expressed in 2018 ZAR/kWh [4].

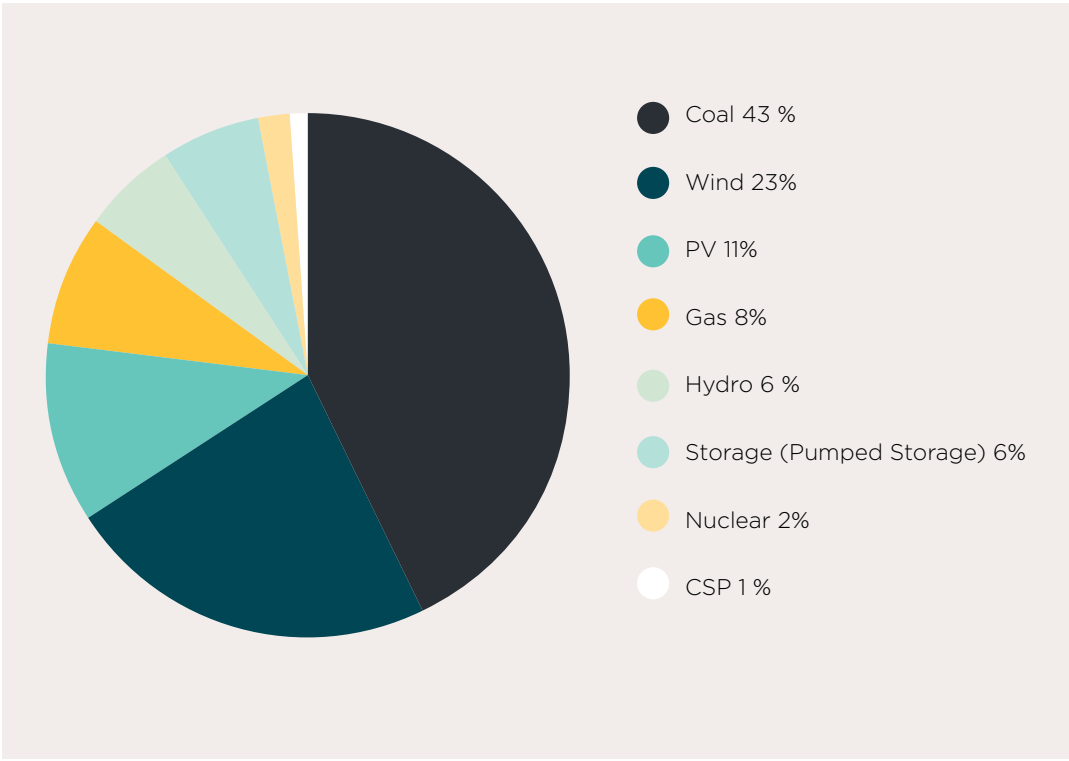
Title	Round 1	Round 2	Round 3	Round 4 (A&B)	Round 4 expedited
Wind (R/kWh)	1.66	1.31	0.96	0.76	0.68
Total reduction from round 1 (%)					-59%
Solar PV (R/kWh)	4.02	2.40	1.29	0.96	0.68
Total reduction from round 1 (%)					-83%

capacity to the grid as follows: 1500MW of coal, 2500MW of hydro, 6000MW of solar PV, 14400 MW of wind, 2000MW of storage, and 3000MW of gas [5].

It is important to note that renewable energy infrastructure does not necessitate a particular ownership structure. It can be state-owned or privately owned. Eskom owns the 100 MW Sere Wind Farm in the Western Cape, which was commissioned in 2015. The President has indicated that Eskom is to expand its renewable energy investment to ensure security of supply into the future. Many stakeholders from the labour movement have been promoting the concept of a socially owned renewables sector, seeing the potential of the technology to provide economic empowerment opportunities for different communities. As things stand, however, this potential is far from being realized.

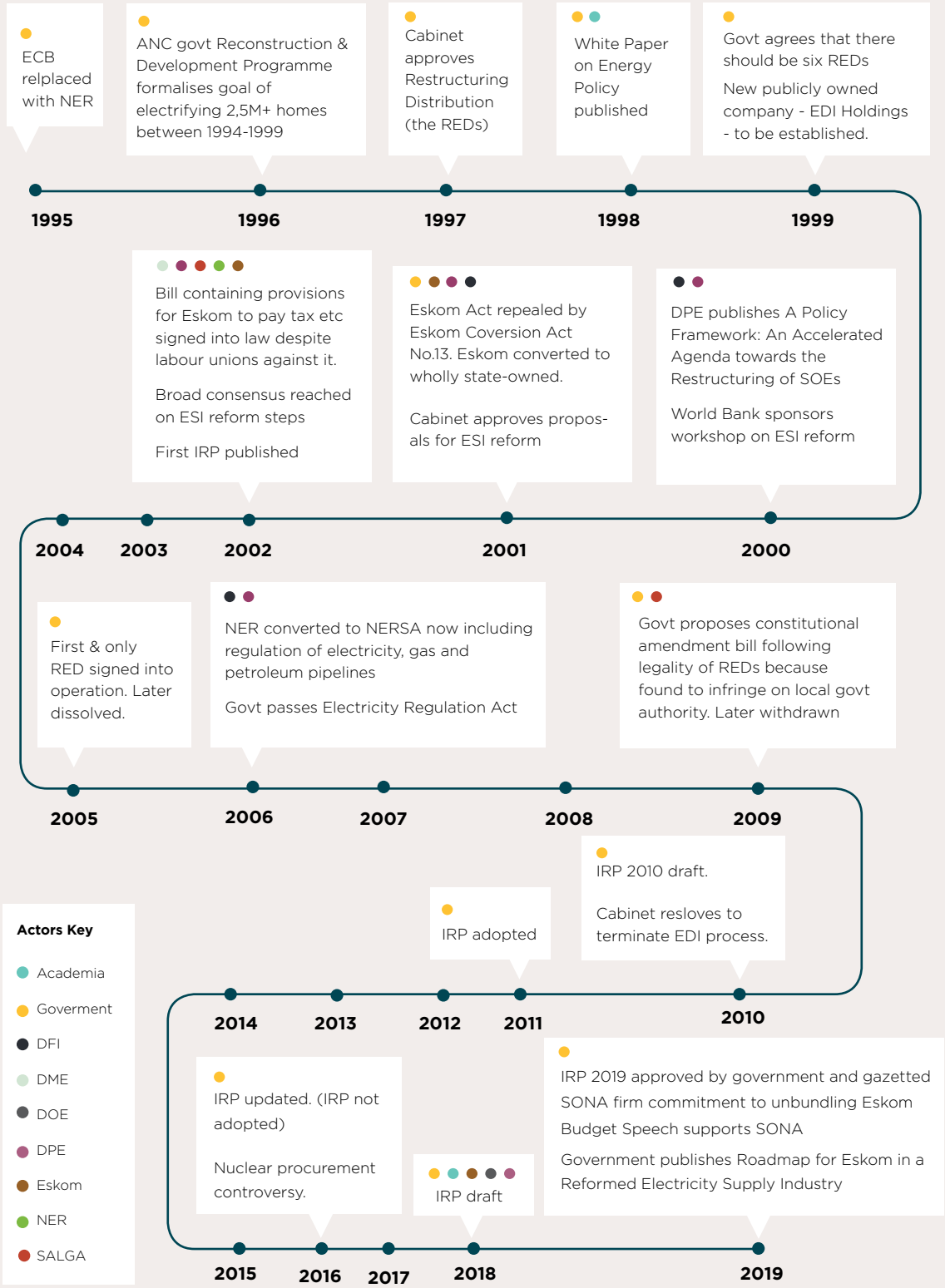
The IRP 2019 envisaged a total installed capacity mix by 2030 that will consist of 33364MW of coal (43%); 1860MW of nuclear (2%); 4600MW of hydro (6%); 5000MW of storage (6%) incl. pumped storage; 8288MW of solar PV (11%); 17742MW of wind (23%); 6380MW of gas (8%) and 600MW of CSP (1%). [6]

Figure 3: IRP 2019: Installed Capacity Mix by 2030



Source: IRP 2019

Figure 4: Key Dates: South Africa's Power Sector Policy Reform Timeline



HOW DOES UNBUNDLING FIT INTO POWER SECTOR REFORMS?

THE CONCEPT OF UNBUNDLING BRIEFLY EXPLAINED

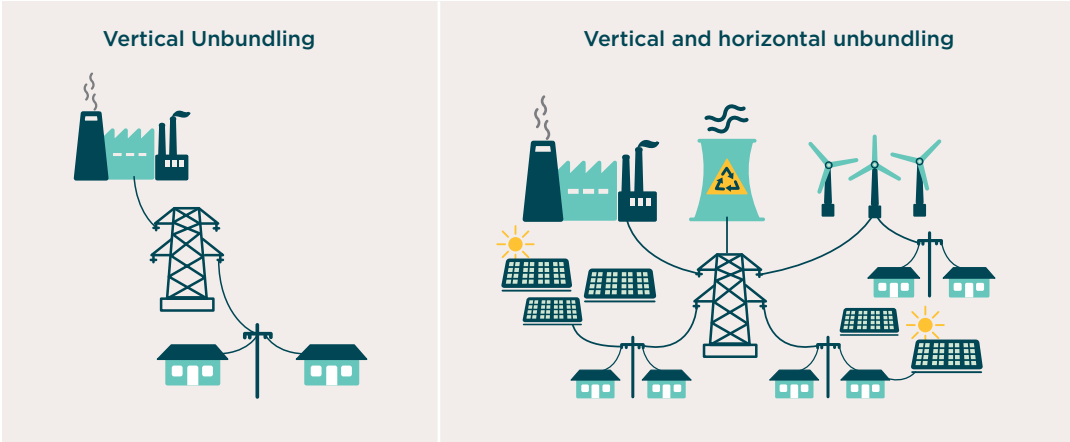
Power sector reforms comprise a range of interventions in the policy and regulatory landscape that change the way the sector is structured and how different actors participate in that sector. Unbundling is a component of electricity sector structural reform that involves separating large, **vertically integrated power utilities** like Eskom into smaller entities, focused on one part of the value chain with specialized core functions.

Vertical unbundling is the separation of generation, transmission, distribution and (sometimes) retail (or electricity sale) functions. This form of unbundling allows for separation of parts of the entity that require different types of business models to succeed:

- Non-competitive, natural monopoly segments (transmission and distribution) that generally require a single actor (mostly state) to manage infrastructure effectively; and
- Potentially competitive segments (generation and retail) where many actors (state or private) can participate.

Horizontal unbundling is the separation of these (particularly generation and retail) functions into multiple entities, that compete with one another or provide services in different areas. These entities may be private companies, state-owned, or have another ownership structure, for example, a concession or community-based cooperatives.

Figure 5: Electricity utility unbundling represented



Vertical and horizontal unbundling can have a number of benefits for consumers and for electricity sectors in general. Vertically unbundling electricity sectors has been seen as international best practice since the 1990s and has been undertaken by more than 100 countries. By implementing this strategy, each unit in the sector can focus on its core mandate without the distraction of balancing its interests against other parts of the business. Segments of the power sector that are potentially open to competition (especially generation) are separated from the natural monopoly components (the wires – i.e. transmission and distribution). General wisdom is that this focus can contribute to performance improvements. Key outcomes for **vertical unbundling** are increased competition, efficiency, transparency and governance improvement:

1 **Competition and efficiency**: Competition between power companies (e.g. between different generators) is seen as desirable because it supports greater efficiency and least-cost service provision. Reducing costs can decrease the price that consumers pay for electricity services or the rate at which prices increase over time.

2 **Transparency and governance:** Vertical unbundling allows for greater transparency on matters of financial management and accounting for costs within the system. Like competition, transparency supports efficiency in each unit. As importantly, it is a basic requirement for good governance and to maintain accountability between the energy sector and the society it serves. Transparency and good governance also create a more attractive environment for lenders and investors, contributing to lower costs associated with capital investment and borrowing.

Horizontal unbundling often accompanies vertical unbundling, allowing for the entry of new players, which could include private companies, community cooperatives, or other organisations, in the sector. Key outcomes for horizontal unbundling are cost-saving and risk management and resilience:

1 **Cost-saving: Having more than one service provider creates an environment where companies compete with each other to provide lower prices and innovative products (e.g. new technologies), ultimately benefiting the consumer.**

2 **Risk management and resilience:** Horizontal unbundling also i ncreases the resilience of an electricity sector. This is because including multiple actors allows for the diversification of power sources. If one power company or technology experiences challenges, others continue to operate. This reduces electricity supply risk.

"Vertical and horizontal unbundling can have a number of benefits for consumers and for electricity sectors in general. Vertically unbundling electricity sectors has been seen as international best practice since the 1990s."

Figure 6: Transformation of the Traditional Grid: A Glimpse into the Future

Prosumers produce electricity and feed it back into the system

The traditional grid will be transformed as electricity consumers also become producers (prosumers).

HOW CAN UNBUNDLING AID ESKOM?

Eskom's dire financial and operational is rooted in its structure and massive size. It is hoped that unbundling will support functional focus and competition that brings about greater efficiency, resilience and sustainability to the sector; and increase transparency and accountability across functions. Given the urgency of the situation, the following issues must be urgently addressed:

Issue	Possible solutions through unbundling
Eskom's financial problems are mainly in its generation business. These need to be ring-fenced and contained to prevent these from eroding the capability of the transmission business	Contain the financial risks that are concentrated in Eskom's generation business by separating it from other better performing parts of the business.
The heart of the power system (the grid and the transmission system) needs to be protected	The transmission grid will be placed in a separate entity that will remain state-owned, because transmission is a natural monopoly, which can raise its own finance at better rates than Eskom can in its current form.
Eskom's debt is expensive and unsustainable, and financers are able to charge extortionary rates because of how risky the entity is	Unbundling could be the first step in allowing the transmission business to access better finance, and in refinancing Eskom's current debt, also signalling to lenders that government is committed to finally solving the ongoing Eskom crisis.
Eskom's conflict of interest as both a generator and single buyer of power from IPPs needs to be removed to ensure energy security	By allowing the transmission company to act independently, it will allow for least-cost power procurement by reducing the current conflict of interest associated with the integration of transmission and generation. This will enable the fast-tracking of procurement of additional state-owned and IPP-owned renewable energy generation capacity being added to the system within the next two years. Alternative sources of power are now competitive. Blocking renewables (as Eskom has done) prejudices investment led growth and consumer welfare.
Eskom's abuse of monopoly power has kept South Africa's system reliant on a coal-fired system that is environmentally unsustainable and financially not viable	Allowing the transmission company to act independently can diversify generation and reduce risks associated with overdependence on Eskom generation.

WHAT IS PROPOSED IN SOUTH AFRICA?

In his State of the Nation Address on 7 February 2019, President Ramaphosa stated that:

> **"Eskom is in crisis and the risks it poses to South Africa are great. It could severely damage our economic and social development ambitions. We need to take bold and decisive action.....To position South Africa's power sector for the future, we shall immediately embark on a process for establishing three separate entities – Generation, Transmission, Distribution, under Eskom Holdings.....Of particular and immediate importance is the entity to manage an independent state-owned transmission grid combined with the system operator, and power planning, procurement and buying functions. It is imperative that we undertake these measures without delay..."**

This announcement followed recommen-dations made by the President's Eskom Sustainability Task Team and extensive discussions in the ANC NEC and Cabinet.

The Eskom Sustainablity Task Team

In December 2018, President Ramaphosa appointed a high-level task team of people with extensive expertise on South Africa's electricity system, governance and economics to evaluate Eskom's structural, financial and operational viability. The team comprises Prof Anton Eberhard (chair), Frans Baleni, Mick Davis, Dr Grové Steyn, Dr Tsakani Mthobeni and Dr Busisiwe Vilakazi. The mandate given to the task team involves: performing diagnostics on the viability of Eskom's existing business model, evaluating energy trends in the global context, reviewing the Eskom board's proposed turnaround strategy, and making recommendations on how to reform Eskom especially with regards to its funding model and governance structures. According to President Ramaphosa's terms of reference, the Task Team would engage in consultation with business, labour, the Eskom board, the DPE and all other stakeholders.

The Task Team has since modelled and made recommendations for Eskom's restructuring, as well as urgent debt relief refinancing proposals to deal with the utility's debt crisis. Some of the aspects of these proposal include a possible multi-billion-rand climate-linked, blended finance facility, and additional support by way tariff increases and government intervention for debt relief.

Figure 7: South Africa's current electricity sector structure

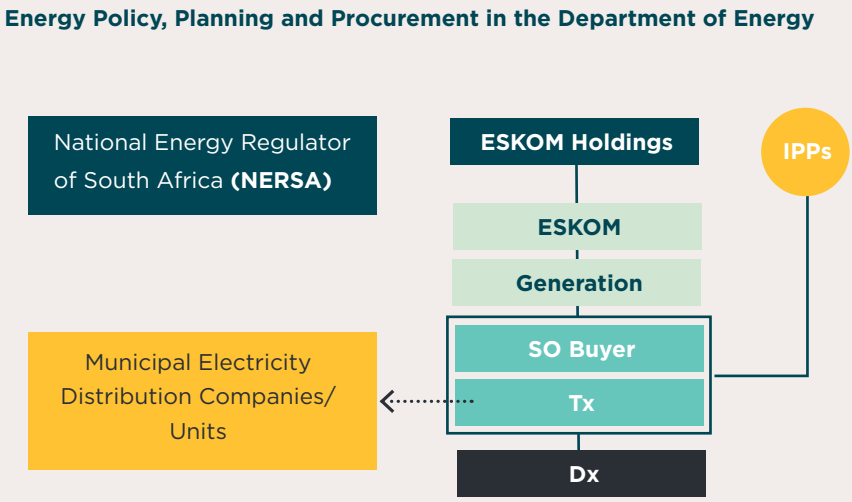
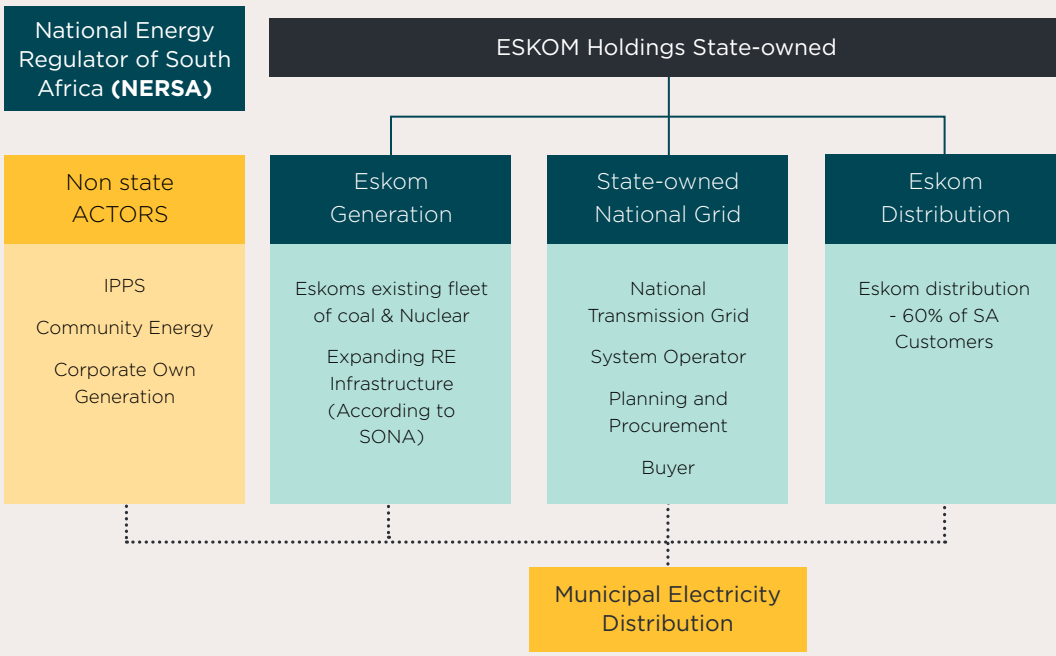


Figure 8: South Africa's current electricity sector proposed new structure



The team has argued that the best way to kick-start the restructuring process is to register a transmission subsidiary company under Eskom Holding, as a first step in the restructuring process, as this would not require any legisaltive changes.

This subsidiary company would have its own Board which would be accountable to the Shareholder (the Minister of Public Enterprises) and to Parliament (through the Portfolio Committee on Public Enterprises and the Portfolio Committee on Energy). It would be responsible for the migration of transmission assets, liabilities, systems and staff, first into the subsidiary company and then, once it is operating effectively, into a separate new state-owned company. Assets to be transferred include: transmission network assets, including substations and associated infrastructure, the national control centre and system operator assets, and possibly also Eskom's peaker power stations (pumped storage, hydro and gas turbines). Relevant licences, transmission servitudes and property rights, as well as transmission licenses and supply agreements with existing clients, will also be transferred. This process could be accomplished within two years. Once significant progress has been made in setting up the Transmission company, work could commence on separating out Distribution.

Significantly, there may already be notable gains for efficiency and governance during this period. The more challenging generation segment would be left with the Eskom board, who could focus their efforts on addressing underlying problems in this area of the business while policy decisions are made around the possible next steps of unbundling. Given South Africa's poor track record of policy implementation when it comes to structural reform in the electricity sector, this proactive step of commencing with the separation of Transmission could also provide the much-needed signal of a credible commitment to transformation in the sector.

Of particular and immediate importance is the entity to manage an independent state-owned transmission grid combined with the systems operator and power planning, procurement and buying functions.

President Ramaphosa – State of the Nation Address, 7 February 2019

In presenting the Eskom Special Appropriations Bill in Parliament on 23 July 2019, Minister Mboweni further stated:

"We really and truly cannot go on like this. Therefore, it is important that Government urgently implements the restructuring of Eskom into three entities - Generation, Transmission and Distribution. Separating Eskom will have numerous benefits such as:

- Allowing strong parts of the business to raise funding more cheaply;
- Creating higher transparency across the value chain and reduce opportunities for fraud, corruption and rent-seeking;
- Creating clear performance incentives in each business;
- Reducing systemic risk South Africa faces by having one very large entity, where problems in one part of the electric value chain now affect the entire value chain. Instead, it will isolate problems and deal with them where they arise, without compromising the entire system;
- Positioning the electricity sector to embrace clean technology, distributed generation and respond to other industry changes;
- Reducing support required from the government in the form of capital outlays and sovereign guarantees, mainly due to increased private sector participation and funding over time;
- Generating competition in the electricity market that is expected to drive improvements in efficiency and put downward pressure on prices;
- Providing open access to the grid and remove conflicts of interest to the procurement of power, both conventional and renewable, from IPPs;
- Diversifying the generation of electricity across a multitude of power producers, thereby reducing the country's reliance on a single supplier; and
- Providing a stable platform for transparently contracting least-cost and most secure power.

However, without major changes to Eskom's business model, the company will not be financially sustainable and may not be able to ensure security of electricity supply beyond the medium-term, with significant consequences for the economy. The frequency of the power shortages has risen in recent years, and government needs to act boldly and decisively. We are therefore committed to a significant reform agenda for the entity."

LESSONS FROM OTHER COUNTRIES

Many countries around the globe have embarked on power sector reforms which have involved a degree of unbundling their respective vertical integrated power utilities. The primary motivations behind these reforms have been the critical need for increased investment and an improvement in sector outcomes. Over 100 countries have created independent transmission and system operation entities – most of which have remained at the hands of the state.

WHAT CAN WE LEARN FROM OTHERS?

Lessons from examples of countries that have undergone power sector reforms

Uganda

CONTEXT, CHARACTERISTICS, DRIVERS OF REFORM	KEY LESSONS AND OUTCOMES
Uganda was the first country to unbundle a power utility in Africa. The civil war of the 1980's had devastating impacts for the country's infrastructures and economy, including a disruption in generation capacity i.e. load shedding stagnated post-war economic recovery. Uganda had to embark on comprehensive policy reforms across the fiscus in order to begin recovery. So, power sector reform (in late-1990's) was part of a broader set of macroeconomic reform processes aimed at uplifting the country. Reforming the power sector was driven by multiple factors, including; weakening utility performance and deterioration of assets, low electrification rate, electricity supply crisis, shortage of domestic capital for investment in power generation and lack of a regulatory framework.	Restructuring resulted in improved sector performance i.e. financial transparency and improved efficiency. Restructuring included the establishment of a comprehensive policy and legislative framework. Restructuring resulted in transmission becoming independent from government and/or political control. Restructuring attracted private sector investment into the sector including IPPS. Power sector reform in Uganda never led full privatisation of the power sector. Instead, Uganda adopted the concessional model i.e. the government continues to retain ownership of all assets, but it concessions the management of generation and distribution.

Kenya

CONTEXT, CHARACTERISTICS, DRIVERS OF REFORM	KEY LESSONS AND OUTCOMES
Power sector reforms in Kenya are still ongoing. Kenya's power sector had many challenges in the 1990's including: low electrification rates, high electricity prices, unreliable supply, and very limited fiscal funding for maintaining and building new infrastructure. The Kenyan government was initially resistant to enacting reforms. The restructuring debate was highly politicised. Many had an interest in retaining the vertically integrated model which held a monopoly over the sector. Eventually, power sector reform was later recognised as a critical component of driving broader economic growth and development for the country.	The first wave of reform began in the mid-1990's. This led to the establishment of a regulatory authority. Generation was unbundled from transmission and distribution. Private sector investment was attracted for the desperately needed build of new generation capacity. The second wave of reforms began in the 2000's. This led to the establishment of a new regulatory authority to replace the previous one. Reforms led to the development of a competitive market structure for generation and distribution. Kenya's generation company (KenGen) was partially privatised (30% of its shares are listed on Nairobi Stock Exchange). A new transmission company (KETRACO) established to assume responsibility of new transmission infrastructure build and financing. However, the operation of the grid and ownership of all existing transmission assets remained with the previous transmission and distribution company (KPLC). Further unbundling of KPLC into an independent transmission state-owned company and separate distribution company is planned but has not yet been implemented. Overall, restructuring thus far has led to a tripling in generation capacity, supply security, increased electrification rates, increased private sector investment and improved sector performance.

Mexico

CONTEXT, CHARACTERISTICS, DRIVERS OF REFORM	KEY LESSONS AND OUTCOMES
Mexico implemented comprehensive energy sector reforms in 2013. The restructuring of the power sector was regarded as part of a broader set of energy sector and economic reforms. Mexico embarked on these reforms in an attempt to boost economic growth and development. Prior to the Mexico embarking on reforms, the power sector was characterised by high electricity costs (which affected household and business), slow implementation of renewable energy projects, high losses in transmission and distribution, a forecasted supply shortage in generation capacity, limited transparency a lack of competition in generation, a lack of competition and a few companies monopolising the generation industry.	Restructuring led to generation, transmission and distribution all being legally separated under subsidiaries of the existing state-owned utility. Generation became fully competitive despite the utility retaining ownership of two-thirds of the generation capacity Restructuring led to the establishment of an Independent System Operator that would manage the wholesale electricity market and essentially remove conflict of interest. Restructuring led to the establishment of a strong regulatory framework which has since proven to be critical in ensuring transparency and accountability.

As briefly demonstrated above, unbundling can and has been implemented differently in different countries, with variation in:

- The extent of vertical unbundling
- The extent of horizontal unbundling
- Who owns what in the energy sector
- How the private sector participates in the sector
- How decisions are made and who is involved in these processes

Nevertheless, unbundling has, in most cases, resulted in positive benefits.

HOW CAN WE SHAPE SOUTH AFRICA'S REFORM PATH?

South Africa's unbundling has begun with a high-level commitment from the President and members of Cabinet. From this point, there are at least two paths we can take with different processes and timelines.

The first approach is to devise a comprehensive plan for structural overhaul with a short- medium and long-term, step by step plan to achieve a clearly defined end state. This approach typically requires extensive policy reform upfront, followed by new legislation setting out the required

steps. If we follow this approach, new policy and legislation is required ahead of any implementation. Due to the long lead time associated with policy and legislation processes, there would be a large lag between the president's announcement and any concrete action.

The second approach is incremental and would be to combine policy design and implementation from the start. This approach involves taking practical steps to steadily transform the sector within existing legislative frameworks, based on international experiences and local expertise. At the same time, policy and legislation would be developed, based on insights developed in the process of taking concrete actions. While it is necessary to have a vision of the end state, this vision can evolve over time, as we learn how 'best practice' policies fit into the local context and work in South African institutions. We can also change this vision as new technologies become available or cheaper. An incremental approach allows decision-makers to build consensus on one step at a time, to take a country forward. Some of the benefits of unbundling could also be realised over a shorter period than if a total overhaul is pursued from the beginning.

It makes sense to start with the unbundling of Transmission as all desired futured power market models (with the exception of a vertically integrated monopoly) include a separate transmission company, with or without the system operator. This is thus a least-regret, low-risk, high reward step. It will allow much greater management focus and efficiencies in the different components of the electricity value chain. It will also mean the establishment of a fair and transparent platform for competitive procurement of least-cost power going forward, thus setting the sector on a new path.

Any policy change is challenging, and some actors will resist reforms to protect their own interests or because new systems are intimidating and present unknown risks. Implementation often fails when all stakeholders need to buy into a rigid plan upfront. For this reason, the second approach may be more desirable in contexts where there is a high degree of disagreement around exactly what the ultimate vision for the sector is. In both cases, public education and broad stakeholder engagement have been shown to be critical to successful implementation.

Change involves uncertainty. We should thus not try to predict the future exactly, rather we should put in place a framework for pro-active policy, regulatory, market and institutional reforms that are robust in terms of uncertain changes already underway; capable of facilitating emergence of an efficient portfolio of both centralized and decentralized energy resources; and the structure of the electricity sector should be designed to minimize potential conflicts of interest. The modest step of unbundling Eskom's transmission business, along with the system operator, into a separate, independent state-owned grid company, sets us on that path.

WHERE DO WE GO FROM HERE?

At the end of October 2019, government published a Roadmap for Eskom in a Reformed Electricity Supply Industry which reiterated that "a new transmission entity will be established in the shortest time possible [with] a new independent Board to oversee governance and operations. This Board will appoint a CEO and management team. A set of interim arrangements may be authorized by Government to facilitate the accelerated implementation.....Responsibility for power planning, procurement and contracting functions will be combined with transmission and system operation." [7]

As it stands, the government has sent a clear signal of a commitment towards unbundling as an attempt to increase investment in the sector and reduce the cost of borrowing. This step has proven to be absolutely necessary if Eskom is to stay afloat. As important, however, is ensuring that unbundling Eskom builds and strengthens the country's democratic institutions and builds capacity in the sector, and for policymaking in general.

The president needs to be supported at this critical moment. To ensure this, there needs to be work to understand:

- Coalitions of support: who are they and why do they support reform?
- Who has concerns, what are they and how do we address them? This is especially true for workers who are concerned around job losses.
- In practice, the first restructuring step of setting up a separate Transmission company, will not involve any job losses. Concerns around privatisation may also be allayed as Transmission will be a separate state-owned company, as it is in the majority of countries globally that have unbundled their electricity utilities.

In terms of the immediate next steps, it is important to learn from past implementation failures and make sure that steps planned next are pragmatic, doable, incremental, building momentum to carry South Africa through a just transition towards a sustainable and inclusive energy system.

Climate-linked finance for a sustainable power sector

One of the recommendations of the President's Eskom Sustainability Task Team is to explore the feasibility of lowering the cost of debt to Eskom through a climate-linked blended finance facility. Concessionary climate-linked finance would be blended with DFI and Institutional funds with a weighted average cost of capital much cheaper that Eskom can currently access. In return, the South African government and Eskom would need to commit to the accelerated closure of old, dirty, expensive coal-power stations. Eskom has already started closing some its oldest coal units and initial modelling indicates that even a modest acceleration of this decommissioning programme would be sufficient to attract significant concessionary green finance. Part of the fund would also be dedicated to supporting just transition investments in communities in Mpumalanga which are already experiencing the inexorable decline in coal-related jobs.

"To this end, a proposed $11-billion (R160-billion) just transition transaction is being developed, consisting of a blended finance facility and would be the largest climate finance transaction to date, having a significant emissions impact."

Statement by President Ramaphosa to United Nations Climate Action Summit, September 2019

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As we address the challenges that face Eskom, we also need to safeguard our national fiscal framework, achieve a positive impact on our sovereign credit rating, and pay attention to the rights and obligations of Eskom's funders.

Eskom has come up with the nine-point turnaround plan which we support and want to see implemented. In line with this plan, Eskom will need to take urgent steps to significantly reduce its costs. It will need more revenue through an affordable tariff increase. We need to take steps to reduce municipal non-payment and confront the culture of non-payment that exists in some communities.

To ensure the credibility of the turnaround plan and avoid a similar financial crisis in a few years' time, Eskom will need to develop a new business model. This business model needs to take into account the root causes of its current crisis and the profound international and local changes in the relative costs, and market penetration of energy resources, especially clean technologies.

President Ramaphosa – State of the Nation Address, 7 February 2019