

EE Publishers debate: Should Eskom be restructured, and if so how and when?

Motion 3:

The business model of Eskom, and indeed the whole electricity supply industry in South Africa needs to be fundamentally restructured to make it fit-for-purpose to face the challenges of future electricity supply, generally along the lines proposed in the Government White Paper on Energy Policy of 1998.

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10 May 2018

Introduction

- Motion 3 argues for the undoing of an institutional framework with roots going back 95 years (ESCOM was established in 1923).
- However, I will show that:
 - this institutional model has long since outlived its usefulness;
 - it has now become critical for South Africa to embrace the technological disruption and address the environmental imperatives in the power sector; and
 - to achieve this, institutional reforms are required, including the restructuring of Eskom and opening of the market.

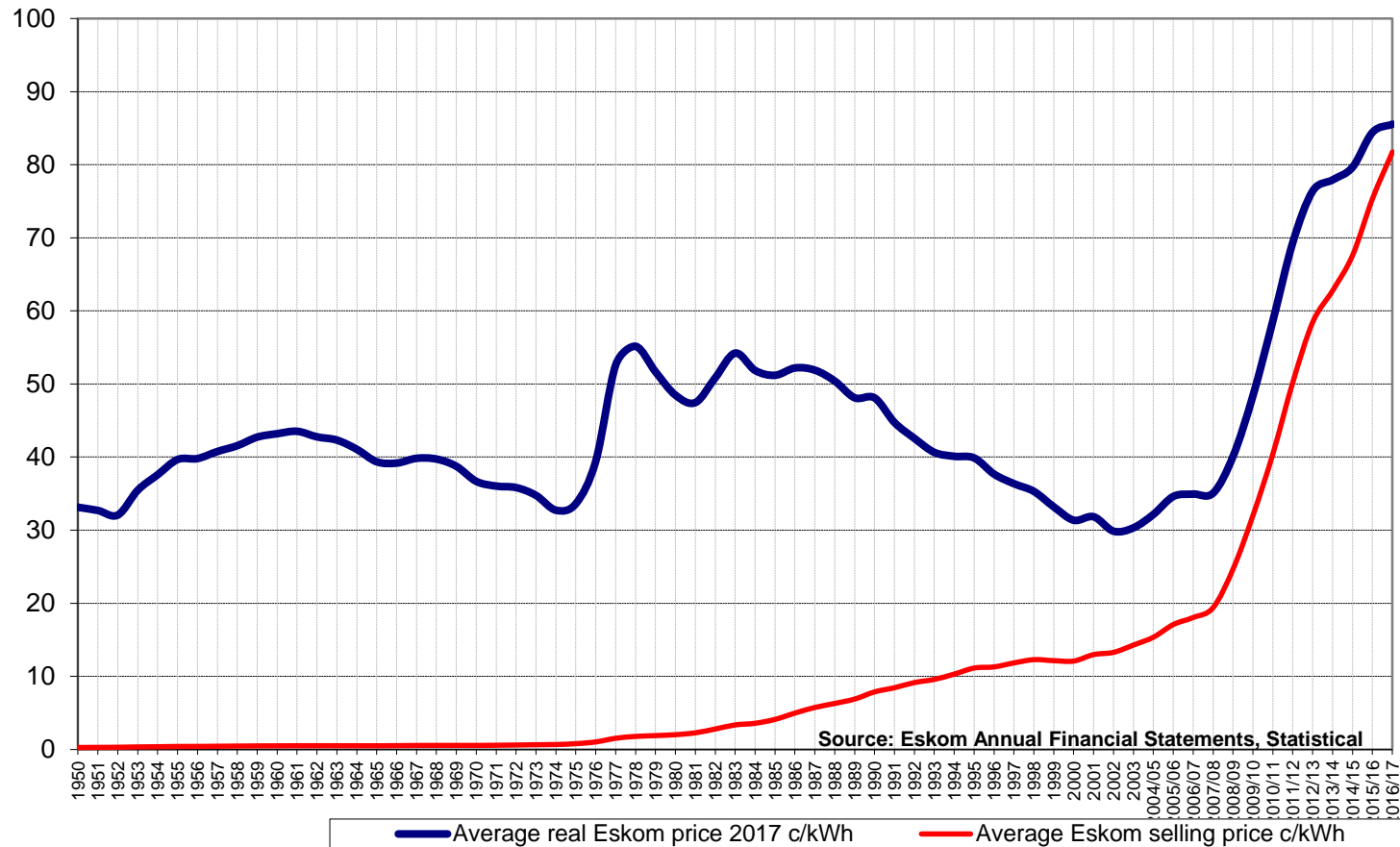
The historic rationale for establishing Eskom as a vertically integrated monopoly SOE

- The pioneers of the 1920s (Charles Merz, Hendrik van der Bijl, Robert Kotzé) understood that:
 - The techno-economic paradigm of coal-fired power relied on exploiting economies of scale.
 - Power stations were therefore always increasing in size; higher steam temperatures and pressures; and therefore also greater complexity.
 - An institutional framework was required to enable funding the enormous capital requirements of the ever scaling coal-power projects.
 - Preferably without burdening the state
 - Establishing a state owned monopoly and a high level of centralised control was considered important to:
 - Enable and de-risk the financing of power projects; and
 - coordinate power sector development on a national scale.

The need for change: Diseconomies of scale

- By the late 1970s The Eskom model became increasingly dysfunctional
- Typically by then the model was leading to inexorable boom and bust cycles:
 - A large inflexible mega project build program is initiated;
 - based on unrealistic demand forecasts;
 - bespoke designs; and
 - at times only partly proven technologies.
 - Enormous time and cost overruns;
 - Load shedding and tariff spikes;
 - Surplus capacity and stranded assets;
 - Repeat 15 years later to greater effect.
- 1970s crisis led to the De Villiers Commission of Enquiry and superficial reforms.
- Eskom was destined to repeat the cycle.
 - See: Steyn, G (2006). Investment and Uncertainty: Historical experience with power sector investment in South Africa and its implications for current challenges. UCT, GSB. 15 March 2006.

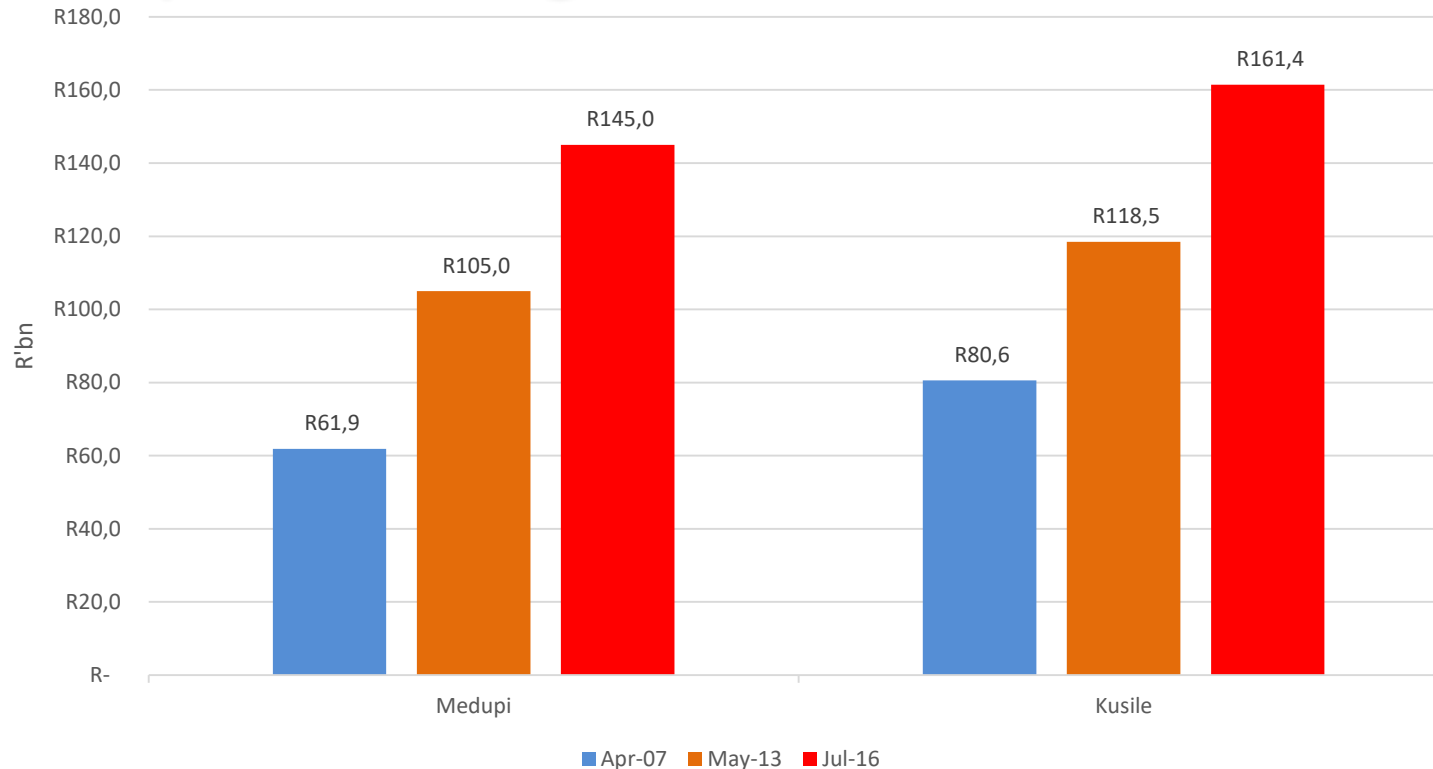
Eskom tariff increases



The need for change: Monopoly and abuse of dominance

- The absence of competition
 - Encourages large inefficiencies;
 - Capital expenditure
 - Project and technology selection;
 - Procurement and project execution;
 - Fuel and operating costs;
 - Results in extensive information asymmetries and managerial moral hazard problems;
 - Allows rent seeking and large scale corruption;
 - These costs are simply passed on to the consumer;
- Constrains access to the transmission grid for competitors.
- Suppression of energy sector entrepreneurship and innovation.
- Only a privileged few have access to opportunities in the power sector.
- The opportunity cost in terms of lost economic growth, development and jobs is enormous, but not visible.

Increases in Medupi and Kusile's capital budgets reflect cost overruns

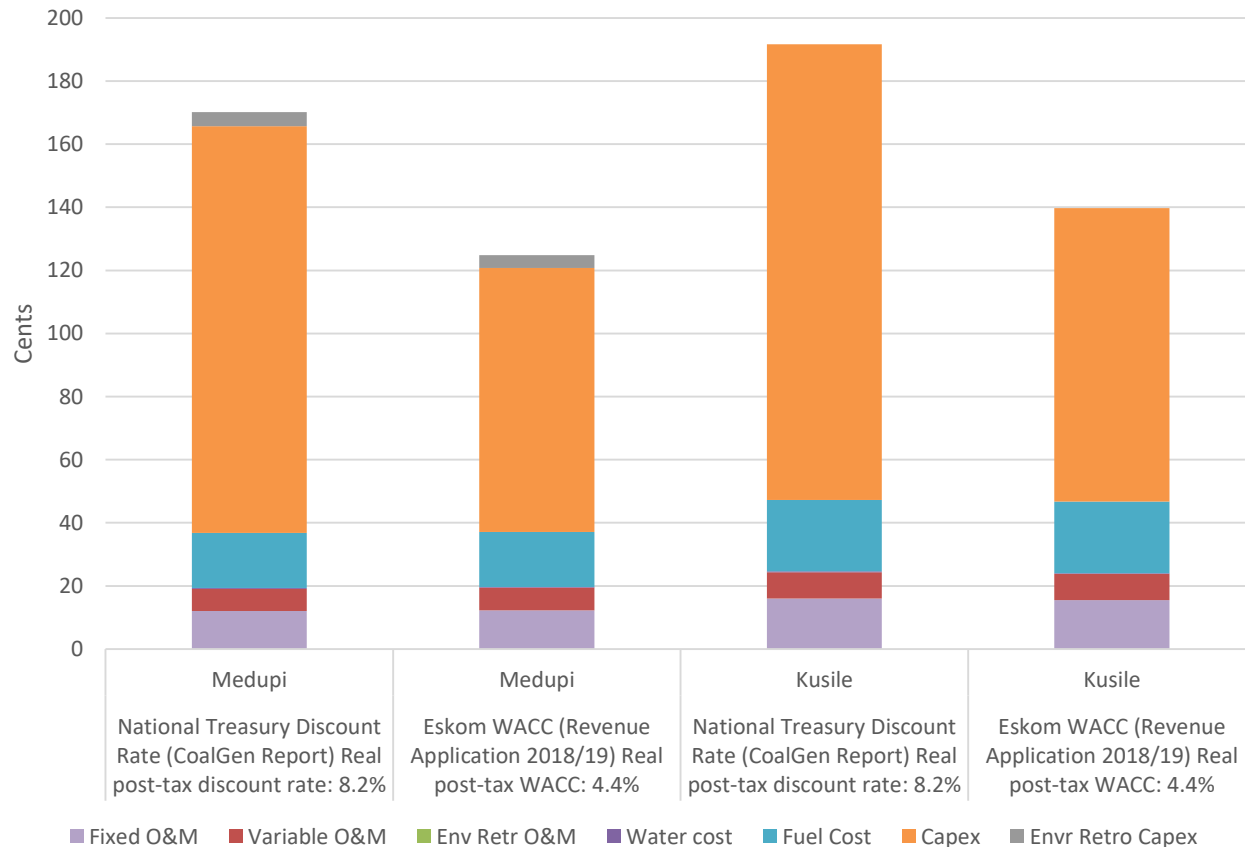


Sources: Various

Medupi: Current budget is R145bn (R83bn more than in 2007)

Kusile: Current budget is R161.4bn (R80bn more than in 2007)

Medupi and Kusile costs per kWh



Source: Meridian Economics, 2017

The need for change:

The unsustainable human and environmental impacts of coal power

- Numerous studies now confirm that the human cost of coal power is enormous especially in the Mpumalanga Highveld and Vaal Triangle.
- For instance, based on the latest scientific methodologies a recent study found that:
 - air pollution from coal-fired power stations causes more than 2,200 premature deaths of South Africans every year;
 - causes many thousands more cases of bronchitis and asthma in adults and children; and
 - this costs the country more than R30 billion annually, through hospital admissions and lost working days.
 - Holland, M (2017) Health impacts of coal fired power plants in South Africa.
- South Africa is a disproportionate contributor to climate change.
 - Eskom stations release approx. 215 Mt of CO₂ pa. or 0.99 kgs CO₂/kWh
- The environmental impact of coal mining activities.
- In the past we accepted these human and environmental impacts because we had no alternatives.
- But, now we do!
- Human health and environmental impacts should be placed back on the agenda of the mainstream conversation about the future of our power system.

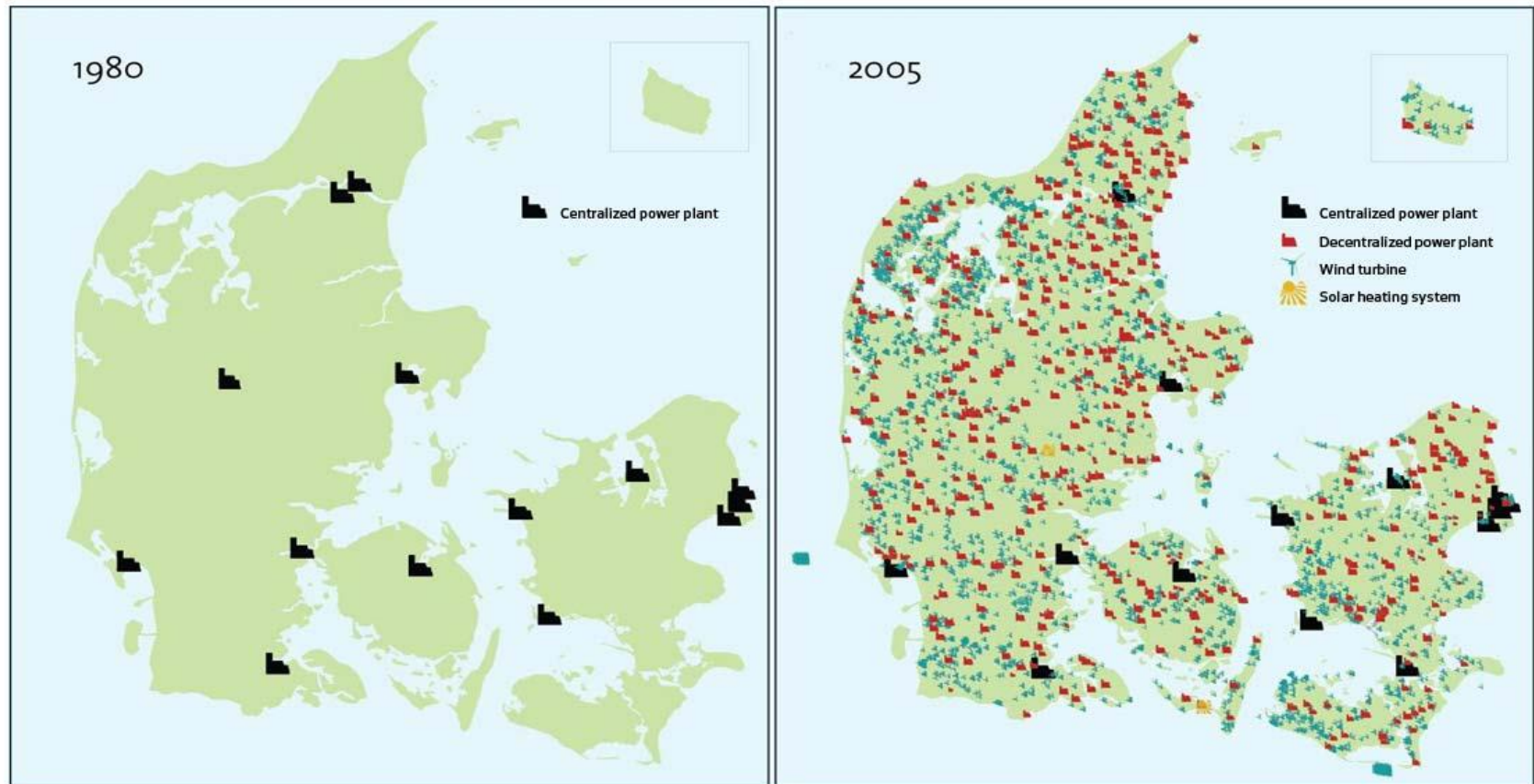
Disruptive technological changes provides new opportunities

- Clean and low cost renewables.
 - Countries such as Mexico, Saudi Arabia, etc. are already realising prices below 30 ZARc/kWh.
 - Embedded generation has become cost competitive against retail tariffs.
- Digitisation of the power system.
 - Smart meters.
 - Prosumers.
 - Community based peer-to-peer power trading - block chain technology, etc.
 - e.g Bangladesh
- Energy storage.
 - Storage costs are rapidly declining.
 - Embedded and grid-scale levels.
 - Electric Vehicles.
 - SA: 2018 Nissan Leaf claims a range of 378 km!
 - At 10kWh/100km and falling prices EVs are rapidly becoming competitive against ICE vehicles.
- Etc.

These changes result in a new power sector techno-economic paradigm

- Economies of scale have almost disappeared.
 - A large turbine is now 7.5MW (wind) not 800MW (steam); and
 - A large power project is now 140MW not 4800MW.
- The cheapest sources of generation (renewables) will produce variable output.
 - Complementary dispatchable mid-merit resources will be valuable; and
 - Inflexible base load resources will lose value.
- Decentralisation.
 - Hundreds of utility scale projects will now be spread throughout the network; and
 - Embedded demand side resources (demand or generation based) will proliferate.
- System balancing.
 - Digitally based market and pricing based mechanisms will play a much bigger role in order to effectively coordinate a multitude of resources;
 - The role of centralised command-and-control will reduce (but not disappear).
- In general the action will move from the centre to the periphery.
 - Greater energy democracy and choice.

These changes result in a new power sector techno-economic paradigm



Denmark

New institutional models are required

- The monopoly SOE model is a machine designed to produce mega projects and that is what it will continue doing (coal and nuclear).
- The new techno-economic paradigm will require an appropriately matched institutional framework to ensure that South Africa realises the enormous benefits available to us.
- It is now globally recognised that electricity generation is best organised as a competitive sector.
 - The investment, socio-economic benefits and price reductions achieved by South Africa's auction-based IPP programme provides incontrovertible evidence of the superior benefits of this approach.
- It is equally recognised that Transmission and Distribution networks and associated system operations functions, remain natural monopolies that will not benefit from attempts to establish competitive markets in these areas.
- It is widely agreed that structural separation of the potentially competitive activities (power generation, customer service, etc.) from natural monopoly activities (networks) is required (OECD, 2016).
- As a first step in the reform process South Africa urgently needs an Independent Transmission, System and Market Operator (ITSMO).

The benefits of structural separation and an ITSMO

- It will resolve the inherent conflict of interest arising from Eskom as a generator also controlling the platform on which it has to compete with other players.
 - This will enable greater choice for buyers of power and improve competition.
- It will significantly reduce the information asymmetries in the industry by establishing an independent centre of system expertise without vested interests in the generation sector.
 - This will greatly enhance policy making; the IRP; and sector efficiencies.
- It will contribute to the solution of Eskom's current financial crisis.
 - Will isolate the problem areas (Generation) in order to focus managerial effort on these problems.
 - protect the financial integrity of the foundation of the system – the network.
 - Stand alone network business can carry a larger debt ratio.

Establishing the ITSMO and increasing competition

- The first interim step is to set up the Transmission Group as a subsidiary of Eskom.
 - Board independently appointed.
- Within two years establish the Transmission Group as a directly held, state owned ITSMO with the appropriate NERSA licence.
- Pass legislation to clarify the powers and functions of the ITSMO.
- We need to come to terms with the extent of Eskom financial crisis and put in place financially sustainable solutions that do not impede but support South Africa's energy transition.
- We should encourage more competition in the sector.
 - Municipalities and large customers should be unambiguously free to procure their power from where they wish.
 - Projects of 10MW and below should be deregulated (exempt from licencing - see the SALGA declaration).
 - The IRP should be established as a regularly updated non-binding policy guidance.

If the politics of restructuring is to work we will need to address the social impacts of the Energy Transition head-on

- We need to honour the coal mining and power station communities whose labour has been the foundation on which South Africa's industrial development has been built.
- Unions and other stakeholders are of course right to point out their concerns about the plight of these communities as older stations are closed and displaced by new capacity in different locations.
- Economic opportunities for these communities at our older power stations;
 - are currently being displaced by Eskom's Medupi and Kusile power stations; and
 - will in future also be displaced by new power projects (renewables, gas, etc.)
- If we want stakeholders to align on the need for institutional reforms to enable South Africa's energy transition we must NOW map out the practicalities for a Just Transition for these communities.
- South Africa needs more than an IRP, we need a broader holistic energy strategy to align stakeholders with the Energy Transition.

Conclusions

- Motion 1: No restructuring
 - As argued above, the status quo has become structurally dysfunctional and will not deliver the benefits of the energy transition.
- Motion 2: Shallow restructuring
 - The criticisms of Motion 1 applies
 - Partially privatising Eskom will further exacerbate the monopoly problems (e.g. the history of Telkom).
 - Increased equity injections into Eskom will not be viable before clarity is obtained about:
 - the valuation of the Generation business; and
 - whether Eskom might have stranded debt.
- Motion 3: Deep restructuring
 - The establishment of an ITSMO, deregulation of smaller projects and (larger) customer choice are the first important steps to reforms that will realise the benefits of the Energy Transition.

Final Conclusions

- We should learn from the farsighted pioneers of the 1920s
 - They were not blinded by the status quo around them, but
 - could see the promise of the emerging power technologies of the day, and
 - understood the institutional and financial arrangements that were necessary for its realisation.
- Today, we should do the same
 - This debate is not about whether the Eskom status quo should be surviving for another 95 years.
 - It is about what is best for the people of South Africa.
 - We should not be constrained by legacy solutions.
 - We should work out the best arrangements for our time with its unique opportunities and challenges.

Final Conclusions (2)

- The Eskom Board aims to finalise its turn-around strategy by September
- My message to them is as follows:
 - Your moral obligation and loyalty should be towards the people of South Africa, not towards preserving a monopoly business model that has now become dysfunctional.
 - Do not rely solely on internal views and analysis but also engage with external expertise and stakeholders
- Ultimately Eskom cannot drive its own restructuring, this is Government's role.
- Our social and economic development literally depends on whether we are able to recognise that:
 - the world has completely changed since the legacy status quo model was established, and
 - we risk being left behind and not participating in enormous benefits for our people if we do not grasp this opportunity.



Thank you