South Africa's Energy Challenges

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Several decisions and events have contributed to the energy capacity challenges we see today

1998 — Energy paper
Government disagrees with recommendation to construct new capacity

2002 — <10% maintenance
Instruction to keep the lights on leads to structural under-maintenance from 2002 onwards
Cabinet memo: No new generation by Eskom

2007 — New build starts
Medupi, Kusile & Ingula poorly planned and executed with design defects

2008 — Loadshedding starts
Plants consistently run at much higher utilisation than international norms

2010 — Soccer world cup
Lights kept on but serious deficiencies revealed in municipal infrastructure

2014 — Delays in REIPPP
Eskom refuses to sign PPAs
Catastrophic failure at Duvha

2015 — Coal corruption
Move to buy less coal on conveyor, more coal on road
Substandard coal delivered, damage to plant

2017 — Kusile 1 commercial
FGD plant creates significant operational challenges and creates single point of failure.

2018 — Kendal damage
Industrial action at Kendal severely damages plant

2019 — Stage 6 loadshedding
Stage 6 loadshedding starts
Design flaws surface at coal new build

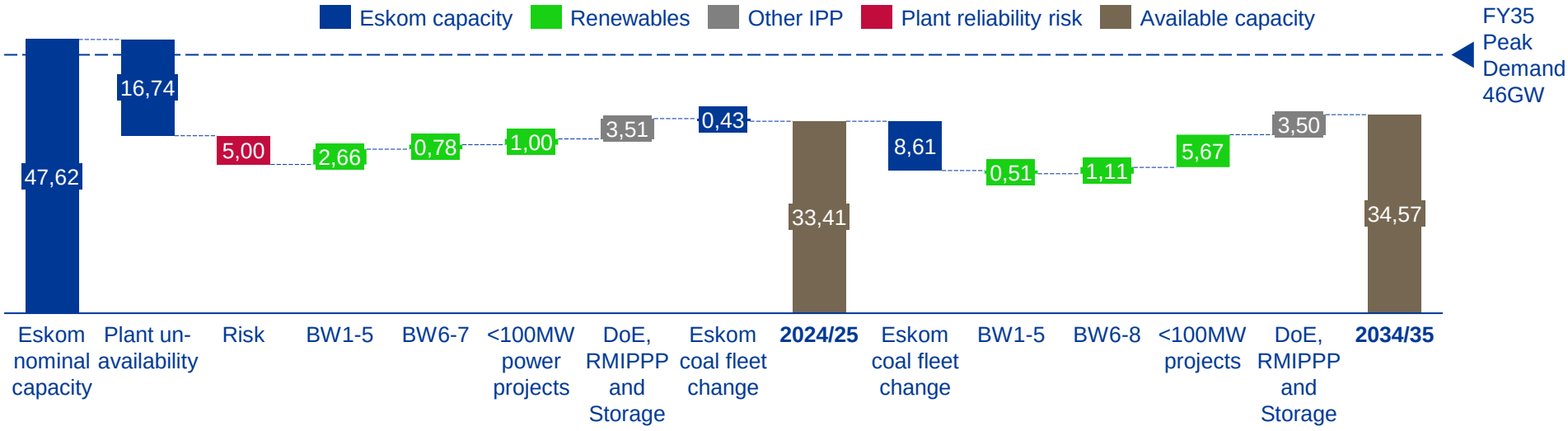
2020 — Additional capacity needed
Communication of urgent need to add ~ 6GW
RMR programme starts

2021 — Min Emissions Standards (MES) decision
- MES decision by DFFE leads to shutdown of 16GW immediately and 30GW by 2025 (decision under appeal & initiating of consultative process)
- Explosion at Medupi 4 results in 720MW loss

2022 — EAF decline
EAF continues to decline
Koeberg 2 taken out for refuelling outage

Current outlook indicates that we have approximately 4 – 6GW peak shortfall by 2024/25 and increasing to over 10GW by 2034/35

Capacity forecasts per energy generation types between 2022 and 2035 (GW capacity)



Insights

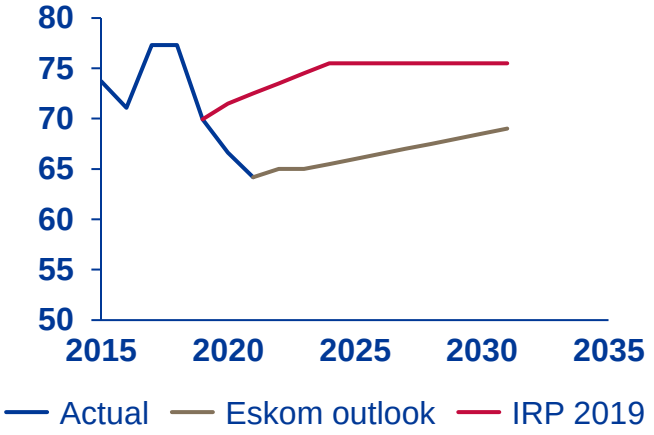
- Eskom current installed capacity is **47.6GW**, assuming optimistic **plant availability of 65% EAF, 31GW available capacity**
- REIPPP installed capacity by 2025 is **11.5GW with an additional 2GW by FY30** resulting in **3.4GW and 0.6GW respective available capacity at a 30% load factor** (earlier BW projects will start ramping down leading up to FY35)
- **System peak demand by FY35** is estimated to be **46GW** based on an **~GDP growth of 2.5%** (and other relevant assumptions)
- Current outlook indicates that Eskom will have approximately 4 – 6GW peak shortfall by 2024/25 and over 10GW by 2034/35

Source: Eskom capacity table; FY23 Corporate Plan IPP assumptions; Dx Grid Access Unit and Meridian Economics report

The need for new capacity is urgent given the significant changes since the integrated resource plan (IRP 2019) was published

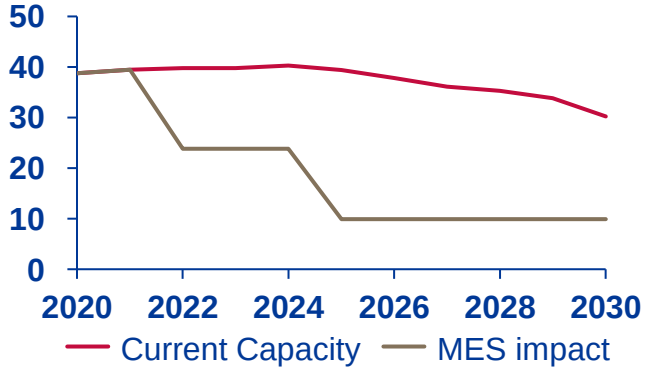
1 Eskom fleet energy availability (EAF) significantly lower than IRP 2019 assumptions

- FY22 EAF 13% points lower than IRP 2019 assumption, translating to ~6100 MW difference
- Over 50% of the stations older than 40 years due for decommissioning by and around 2030
- EAF at new build stations expected to improve as design defects are rectified
- Possible delay of Koeberg's life extension will result in a loss of 1 860MW baseload capacity



2 Developments in emissions standards decision places up to 30GW at risk by 2025

- Since the development of the IRP 2019, DFFE has issued a decision that puts 16GW capacity at risk immediately and 30GW in 2025
- If implemented will result in continuous stage 8 load shedding due to reduced coal capacity
- At least R 300 bn required to achieve full compliance , 10 years to complete



There have been delays in the capacity procurement process however developments in renewable technology present several opportunities

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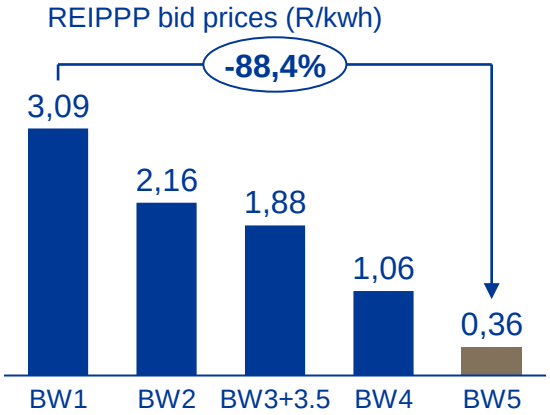
Procurement of new capacity slower than assumed in the IRP 2019

- Currently SA has 25% less renewable IPPs than what was planned for in the IRP 2019
- These delays mean that we will likely have:
  - 14% less renewable IPPs in 2026 and up to 51% in 2031
  - 1 500MW less capacity due to no new coal
  - Inga (~14GW) will not be online by 2030

4

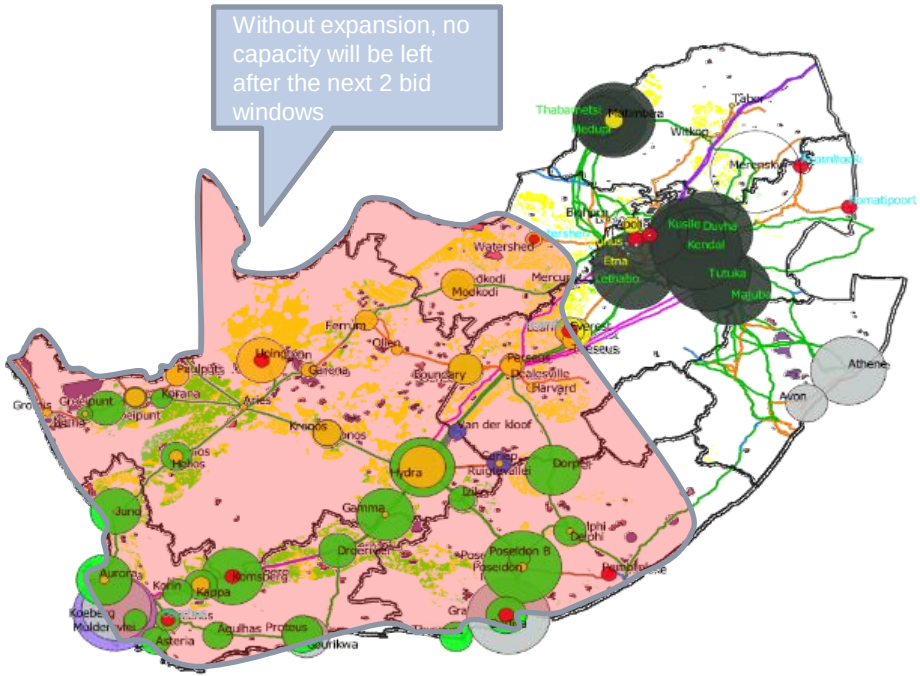
Significant decline in renewable technology costs

- Energy mix with significant solar, wind and storage provides the least costs system in the future
- Comparisons of lowest REIPPP round 5 bids to initial round 1 bids, show that:
  - Wind costs down by ~82%
  - PV costs down by ~91%
- Technology costs have significantly declined, increasing viability of private investments



Significant investment is required to modernise and expand grid infrastructure critical for connecting new generation capacity

The Transmission network is running out of capacity



Transmission infrastructure

- At least 8000 km and over 100 transformers required to expand and strengthen transmission network
- Additional 12 substations across four provinces required (Northern, Western, and Eastern Cape and Free State)
- Obstacles remain servitudes, and local content requirements

Distribution infrastructure

- Over 6000 km of distribution grid expansion, modernisation for IPPs and DERs integration
- Establishment of the distribution system operator and smart grid to enable coordination of distributed energy resources
- Roll out of containerised microgrid solutions to enhance the electrification programme

Capitalise on existing grid infrastructure available now

- 3 GW for BW5 + 11 GW additional
- 4 GW can be unlocked with moderate investments
- ~15 GW can be added by grid expansion by 2032
- As we shut down coal plant, grid capacity becomes available
- Strong appetite from IPPs and local banks to invest in capacity, without government guarantees and without a PPA with Eskom

Mpumalanga offers immediate grid access which will expand as coal stations retire.

5

Eskom estimates that at least R1,2 trillion rand will be required in infrastructure investment before 2030

Capacity required	Required to mitigate energy crisis	Estimated cost
Generation capacity	Firm capacity 6GW Variable capacity 50-60 GW Storage capacity 10GW	**~R990bn**

Transmission capacity	• Expansion and strengthening of transmission network:
	  • ~8000km new line
	  • ~101 substations
		~R130bn

Distribution capacity	• Strengthening of the distribution network for embedded generation ~7500 km of line	**~R56bn**

Approximate capital required for the expansion of R1.2 trillion by 2030.
Given the magnitude of investment required, private investments and PPP will be crucial

Eskom is already making strides in driving energy transition and enabling additional capacity

Repurposing and Repowering

- **Repurposing stations reaching end of life**
- **Komati repowering design of PV, Wind and Battery** implementation during 2022
- Installation of **Agrivoltaics and Microgrid assembly plant**
- **Establishment of training centre in collaboration** with SAWEA

Leverage existing land

- Facilitate **additional generation capacity** quickly
- **Optimising and mitigating impact** of **network expansion & strengthening**
- **Stimulating economic activity** around aging Power Stations that are ramping down

Accelerate grid connections

- Reviewing queuing processes and capacitating Eskom grid access unit to respond to **<100 MW connections**
- Coordinating with **DMRE and IPPs to improve planning and connection** of new capacity projects

Eskom can maximise the benefits of Just Energy Transition

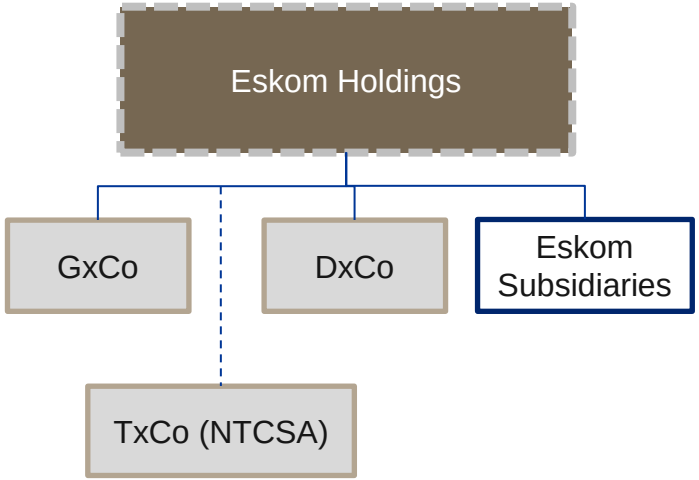
Benefits	Description
 **Greatest reduction of GHGs**	• Electricity generation contributes 41% of SA total carbon emissions • Decarbonising the electricity sector will make the biggest impact: by 2035 CO_2 will be reduced by 38%
 **Fastest and least cost option to close the energy gap**	• Renewable energy is the **fastest way to bring on new capacity,** with build times ranging between 18 months and 3 years • Eskom requires the bulk of the **$8.5bn funding to enable a country-wide transition**
 **Protect SA competitiveness - carbon export tax**	• **~$1.7bn worth of SA exports could be affected** - incur higher costs and reduced competitiveness in the EU • **Electricity sector is the quickest and cheapest to decarbonise** across the economy
 **Job creation by stimulating the economy**	• **> 300 000 net jobs can be created from infrastructure roll out** during construction, operations and manufacturing • Transmission and distribution network expansion will further contribute to large infrastructure projects and potential investment

UNCTAD - United Nations Conference on Trade and Development

Source: Initial Eskom modelling outcomes – to be refined with more refined modelling work in progress; Net job figures based on preliminary analysis done by GreenCape and the NBI

Delivering on the legal separation and addressing the financial sustainability and Eskom is a key enabler to a sustainable electricity supply industry

Eskom separation and establishing independent Transmission and market operator

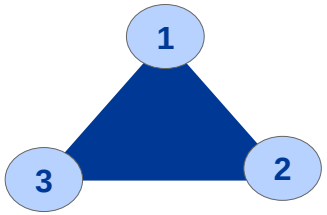


- Corporatisation completed, once fully licenced/operationalised (NTCSA) will:
  - Provide non-discriminatory grid access to generators
  - Manage the energy market

Achieving financial sustainability of Eskom and the industry

Revenue Security

Restructure tariff and achieve cost reflective price path
Improve revenue collection and reducing munic debt



Cost containment

Focus on containing costs and creating transparency

Addressing debt

Reduction of Eskom debt by ~ R 200 bn
Disposal of non-core assets

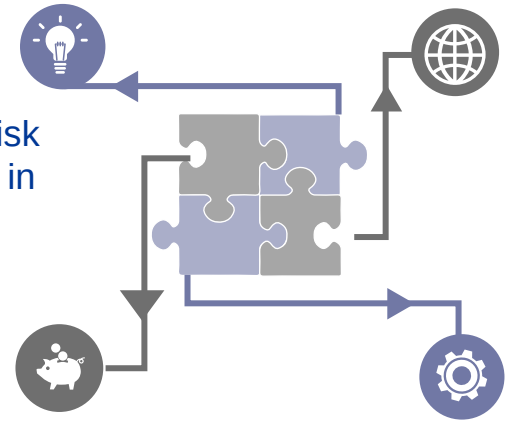
Alignment of energy, environmental, industrial and fiscal policy is fundamental to sustainable future electricity supply industry

Energy Policy

- Revision of the **IRP** in line with latest assumptions to enable investment, particularly for accelerated coal shutdown and increased RE build.
- Revision of the capacity **procurement process** to reduce reliance on government guarantees, reflect lower risk of IPP programme and create certainty in future demand to encourage investors

Fiscal Policy

- **Expedited procurement processes**
- **Reassessment of PPP** for rapid deployment of clean technology
- Optimise **tax** incentives and subsidies to direct them towards high-job multiplier sectors such as manufacturing



Environmental Policy

- Review **environmental policy** in line JET, avoid stranded assets, considering impact on energy supply
- Accelerated EIA process to support clean generation projects
- Declare more REDZs, especially in Mpumalanga

Trade and Industrial Policy

- Optimise **industrial policy** in line with expansion requirements considering localization objectives
- **Minimise trade barriers** by adjusting trade policies that will stimulate future demand, .e.g. reducing EV import duty
- **Special Economic Zones (SEZ),** to support supply chain development and manufacturing in line with the transition, focusing on Mpumalanga

Conclusion

1. Eskom is **driving the recovery of its coal power station performance,** however, this will not be enough to close the gap

2. At least **4000-6000 MW additional capacity is required immediately** to bridge the gap

3. **At least R1,2 trillion rand will be required** in electricity industry investment before 2030, predominantly by the private sector

4. **Eskom sees itself as the enabler of a sustainable energy supply industry** by providing non-discriminatory access to additional private generating capacity, addressing grid constraints and actively driving the **Just Energy Transition**

5. Addressing the **financial sustainability of the energy industry while ensuring alignment of the enabling policy** (energy, environmental, fiscal and trade policies) will improve the speed with which South Africa can navigate out of the energy crisis