

A vertical collage of four circular images on the left side of the slide. From top to bottom: 1) A close-up of solar panels with industrial chimneys in the background. 2) A wide view of a power plant with several large cooling towers and a body of water. 3) A helicopter performing maintenance on a high-voltage power line tower. 4) A worker in a safety harness and hard hat working on a power line tower.

CESA Infrastructure Indaba

18 August 2022

A wonderful morning to you. I am honoured to be part of this Indaba, and I look forward to interacting, learning and engaging with you.

I always start with a profound quote and today is no different. Some wise Engineer said:

Science can amuse and fascinate us all, but it is engineering that changes the world. “The engineer has been, and is, a maker of history.” “Scientists study the world as it is; **engineers create the world that has never been.**” “The way to succeed is to double your failure rate.

Generation Capacity



- Aging infrastructure
- Deteriorating generation performance
- Loss of critical skills

Financial



- Weak balance sheet due to high debt burden
- Lower than cost reflective tariffs
- Low revenue – non-payment & reduced sales

Grid access

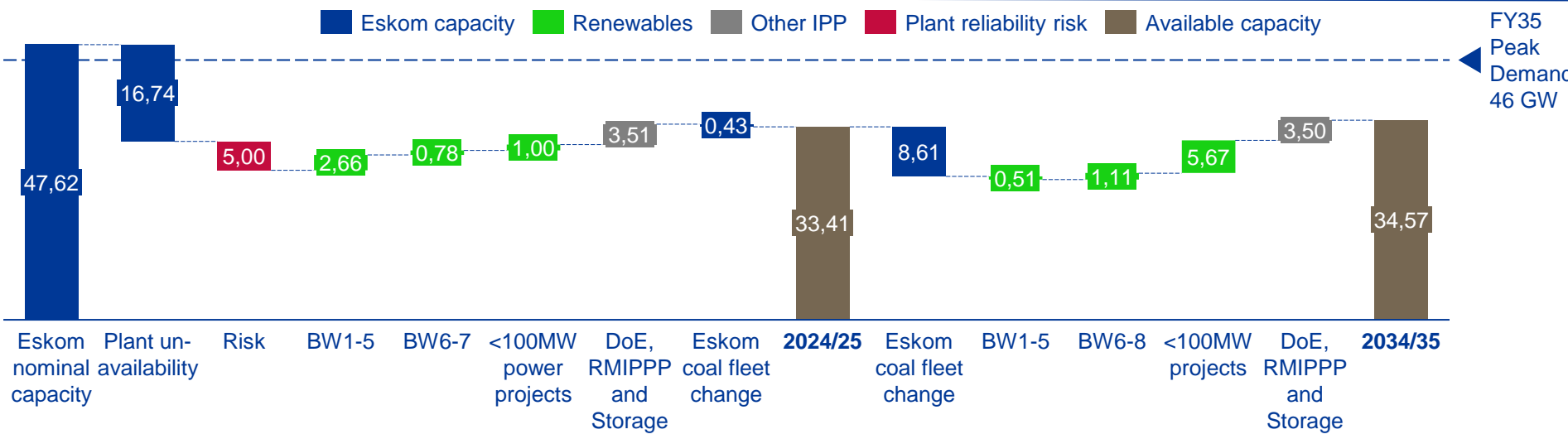


- Grid constraints to connect additional capacity in high yielding areas
- Inability to acquire servitudes timeously

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



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



Insights

- Eskom current installed capacity is **47.6 GW**, assuming optimistic **plant availability of 65% EAF**, **31 GW available capacity**
- REIPPP installed capacity by 2025 is **11.5 GW with an additional 2 GW by FY30** resulting in **3.4 GW and 0.6 GW** 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 **46 GW** based on an **~GDP growth of 2.5%** (and other relevant assumptions)
- Current outlook indicates that Eskom will have approximately 4 – 6 GW peak shortfall by 2024/25 and over 10 GW by 2034/35

Impact:

Coal capacity will decrease by over 78%; Gas & renewables increase significantly

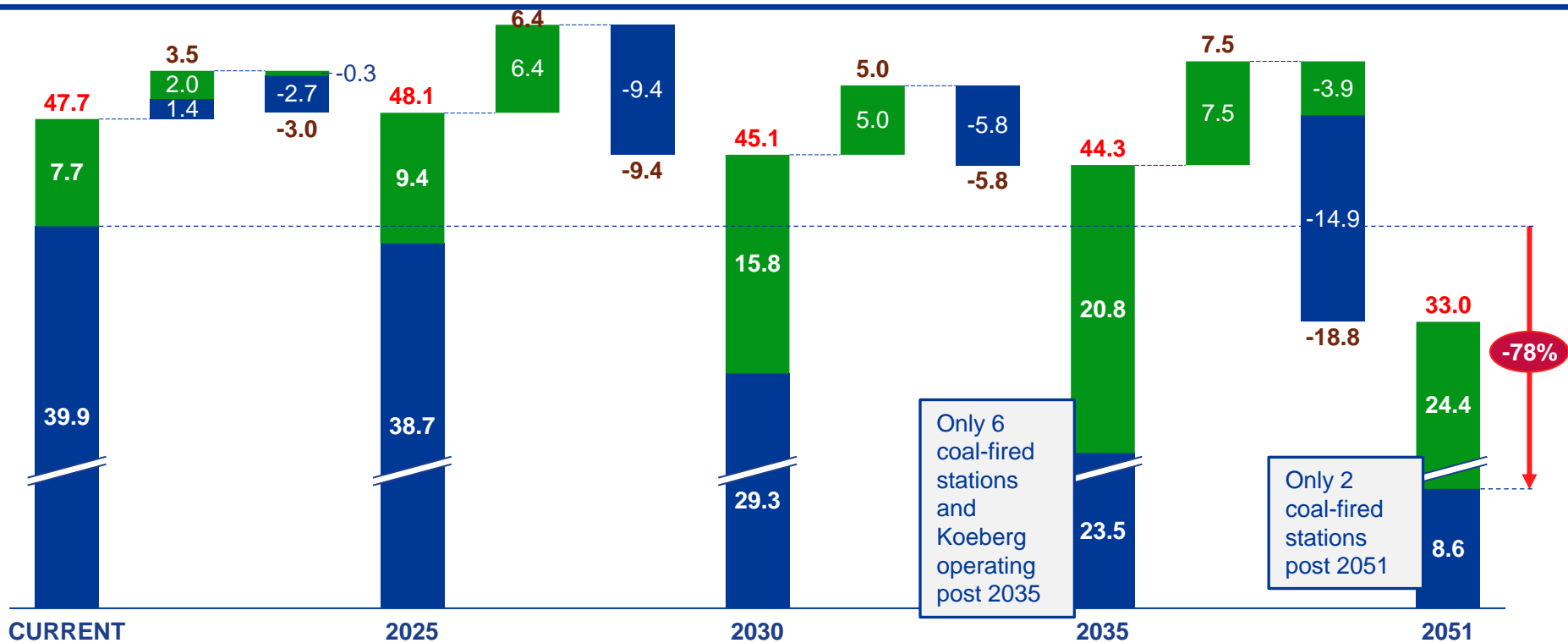
* based on nominal capacity, base excludes units currently in Reserve Storage and extended inoperability

* aspirational



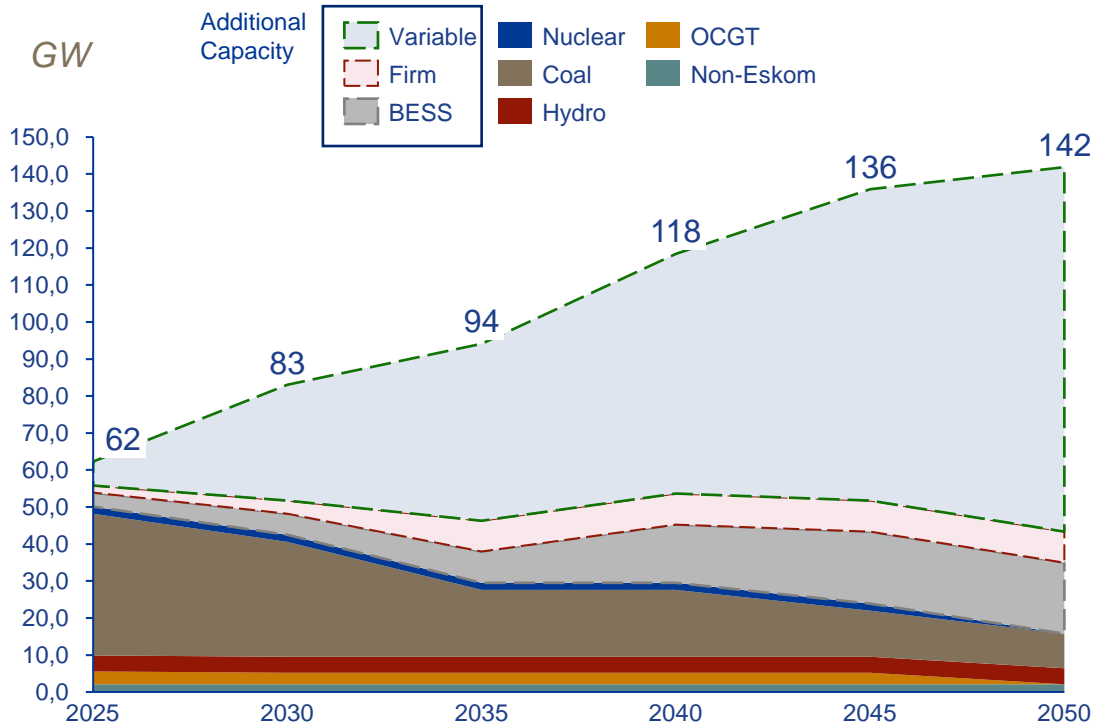
■ Coal ■ Other - Gas, Wind, Solar, BESS, Nuclear

GW (Indicative: Includes aspirational and unfunded projects as well as nuclear new build)



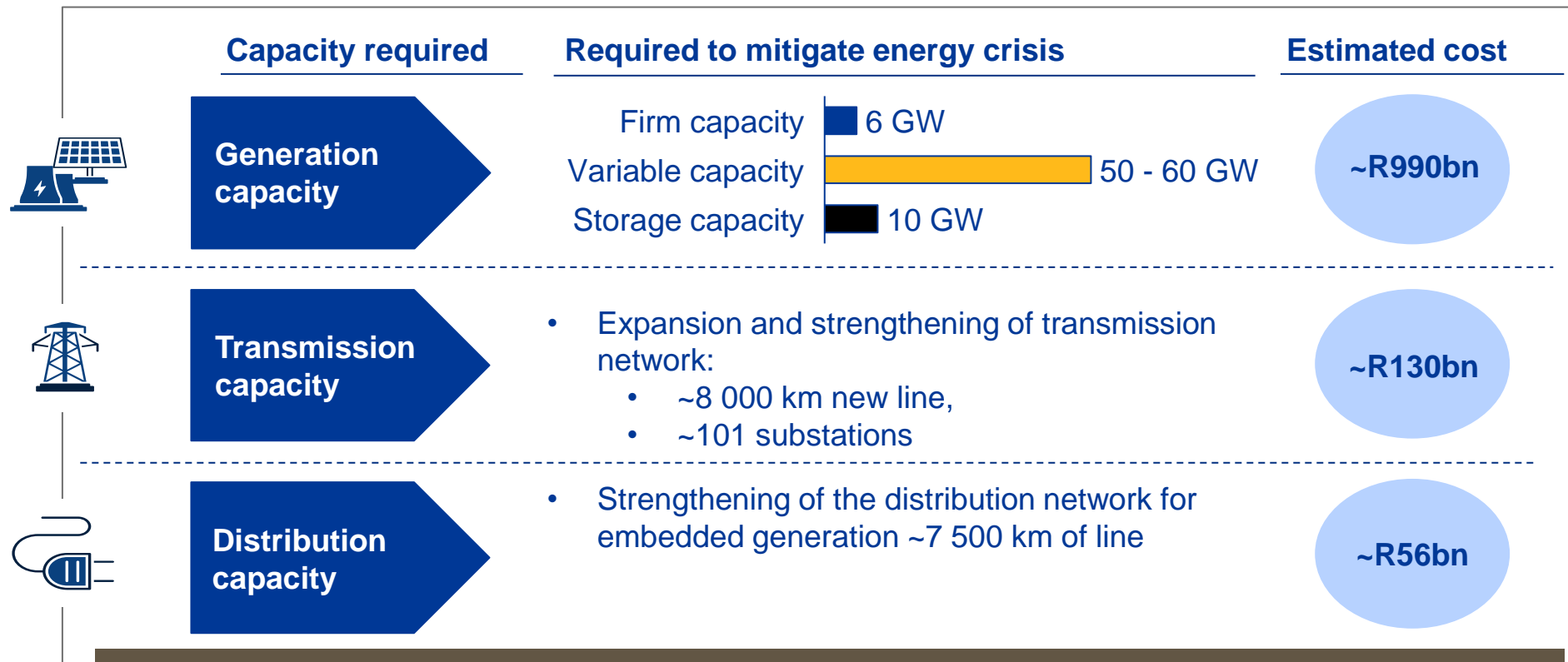
Eskom's existing generation capacity will be ramping down significantly in the next 10 – 15 years, requiring additional capacity

Existing plant and new capacity required to 2050



- Existing fleet generation will ramp down from ~50 GW to ~15 GW by 2050
- Current projections show that **by 2030, new capacity of at least 50-60 GW renewable capacity will need to be added**, even if there is no incremental demand from economic growth.
- The quantum of new capacity required doubles (~120 GW) **by 2030 when a 5% increase in demand growth is assumed.**

Eskom estimates that at least R1.2 trillion rand will be required in electricity investment before 2035



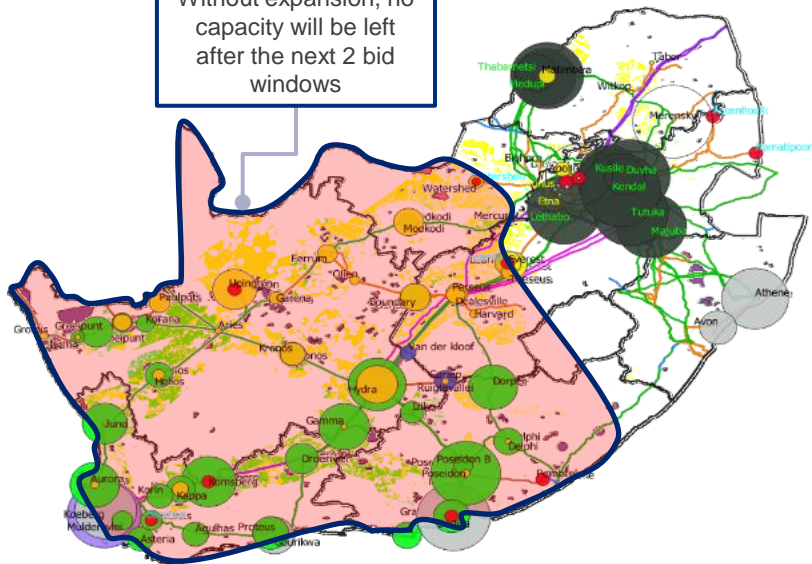
Approximate capital required for the expansion is R1.2 trillion by 2035.
Private investments and PPP will be crucial

Significant investment is also required to modernise & expand the grid infrastructure, connecting new plants



The Transmission network is running out of capacity

Without expansion, no capacity will be left after the next 2 bid windows



Transmission & distribution infrastructure needs to 2035

Transmission:

- >8 000km & >100 transformers to expand & strengthen network
- 12 new substations in Northern, Western, & Eastern Cape, & FS
- Obstacles to roll out: acquiring servitudes & local content reqs.

Distribution:

- >6 000km of distribution grid expansion
- Modernisation for IPPs & DERs integration
- Roll out of system operator, smart grid, & containerised microgrid



Opportunities to capitalise on existing grid infrastructure

- 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 has significant grid availability, renewable resources, people & skills

Mpumalanga offers immediate opportunity – grid availability, significant renewables resources, people and skills

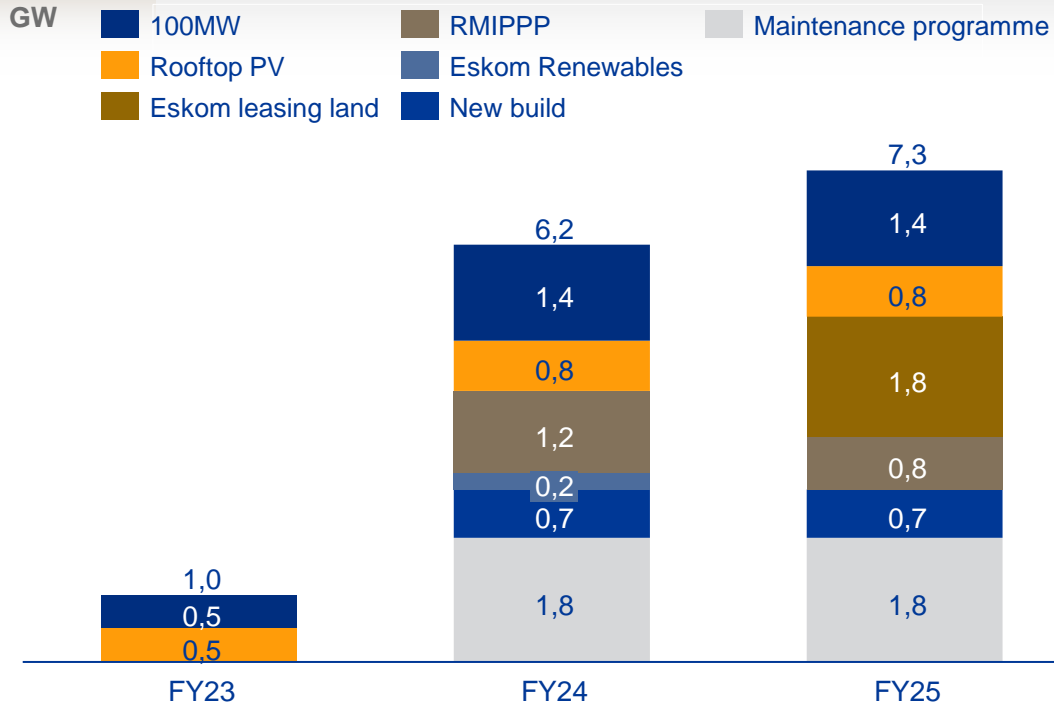
Based on available information, ~11 GW can be brought online over the next 3 years, with an additional 3.6 GW from maintenance program



Overview of annual capacity that can be connected



Insights



- Excluding 3,6 GW recovered from maintenance, an additional **~11 GW full nameplate capacity (excluding load factors) can be connected** over three years, if **performance and load factors are incorporated, this reduces to ~3 GW**
- An estimated 1 GW can be delivered within 12 months from different technology options
- Eskom will drive completion of remaining Kusile units and fix defects for new build
- Accelerating processes to secure environmental impact assessment licenses needs to be expedited to fast track own generation projects
- Implementation of feed-in tariffs to incentivize investment is critical
- Maintenance programme capacity is based on improving EAF to 65% by end of FY25

Eskom is looking at both demand and supply side interventions to address manage the crisis

Increasing capacity

Ave.: 28 000 GW

- Improving plant performance
- Completing and fixing new build
- Unlocking grid capacity
- Developing business models to enable private investment
- Repurposing and repowering

Reducing demand

Peak: 33 000 GW

- Energy efficiency advocacy – national campaigns, revival of incentives
- Power alert - daily notifications between 5pm to 9pm.
- Deployment of Demand Side Management (DSM) and Demand Response (DR) ~1 500 MW over the next 3 years

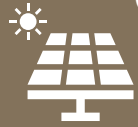
Can be achieved through enabling policy and a collaborative approach between government, labour and business



Additional measures to achieve long-term energy security and end load shedding for good:

- Fix Eskom and improving performance of existing fleet
- Accelerate procurement of new capacity from renewables, gas and battery storage
- Accelerate private investment in generation capacity
- Enable business and households to invest in rooftop
- Transforming the electricity sector and positioning it for future sustainability

Eskom is ready to work with the private sector to resolve the crisis



01

Investing in additional capacity - #100from100

- Opportunities to invest in IPPs through land leasing and wheeling arrangements
- Disused mine shafts, mothballed plants with grid access
- Grid access unit timelines halved, further optimisation ongoing



02

Enhancing demand side management

- Use energy sparingly to safeguard the national grid
- Drive in-house energy saving campaigns



03

Addressing security of infrastructure

- Support in security interventions to protect electricity infrastructure from vandalism and theft



04

Enabling policy for a sustainable ESI

- Contribute to the development and alignment of enabling fiscal-environmental-energy-industrial policies
- Advocacy essential

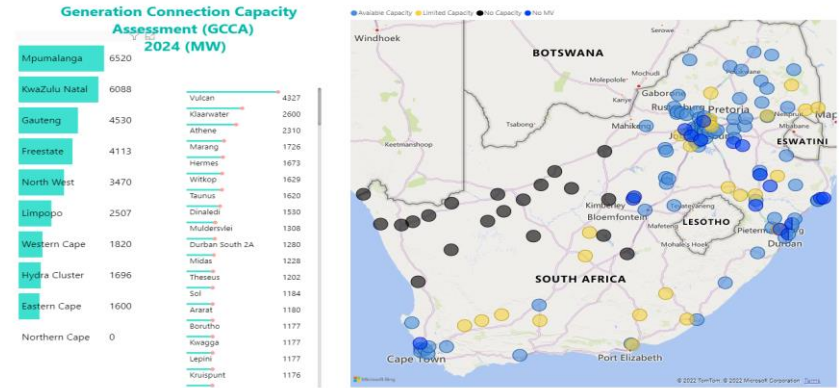
Land leasing together with the grid optimisation initiatives offer great potential to investors to contribute in resolving the electricity crisis

Releasing additional Eskom land



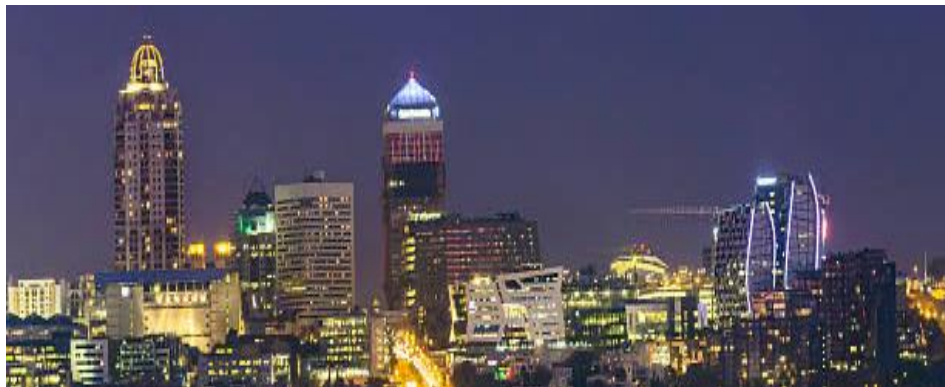
- Eskom has identified ~30 890 ha of land across the country that can be leased with a potential of ~7 020 MW PV capacity
- **Optimising and mitigating impact of network expansion & strengthening**
- **Stimulating economic activity** around aging Power Stations that are ramping down

Unlocking capacity on the existing grid to 17 GW



- Unlocking capacity on the existing grid, reduces time associated with EIA and servitude acquisition
- 12 projects, 27 transformers at ~R8,1Bn in the **North inland** region increasing **capacity to 12,3 GW**
- 10 projects, 18 transformers at ~ R5,8Bn in the **South inland** region increasing **capacity to 4,7 GW**

Eskom is implementing a browsable GIS, mapping RE resources, grid access and available land



- Contribute 10 000 MW to closing the generation capacity shortfall
- Demonstrate leadership in electricity use
- Energy security for business
- Claim carbon credits
- Decarbonise business value chains

#100MWfrom100



#switchoff



#saveelectricity



Addressing Performance



- Increased maintenance within limitations
- **Fixing new build defects**
- **Koeberg 20-life extension**
- Repowering of stations shutting down
- Appointing Plant Managers & engaging experienced experts
- **Policies (MES, PPPFA) and procedures**

Repurposing and Repowering

Komati Power Station has served South Africa since 1961



- **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**

Accelerate Grid Connections



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

Eskom's "Please Use Only What You Need" campaign will encourage more energy savings from the public



"Think before switching on the heater... Electric space heaters can account for up to 17% of your evening peak power click here to find out more"



"The first and easiest way to reduce your usage is to switch off unnecessary lights click here to find out more"



"Boil enough water only for the number of cups of tea or coffee you're making. Use a hot water bottle rather than an electric blanket..."



"Take advantage of sunlight to warm rooms during the day, but then close the curtains to reduce heat loss during the evenings"



"Keep an eye out for Power Alert on SABC, etv and DStv... Please respond immediately by switching off unnecessary lights, your geyser and pool pump..."

To the optimist, the glass is **half full**. To the pessimist, the glass is **half empty**. To the engineer, the glass is **twice as big** as it needs to be. Unknown

To CESA, and especially Godfrey, Thank you for inviting me to this memorable Indaba. Today, I raise my glass to each one of you. God bless Jan



THANK YOU