Eskom's Just Energy Transition (JET) Plans

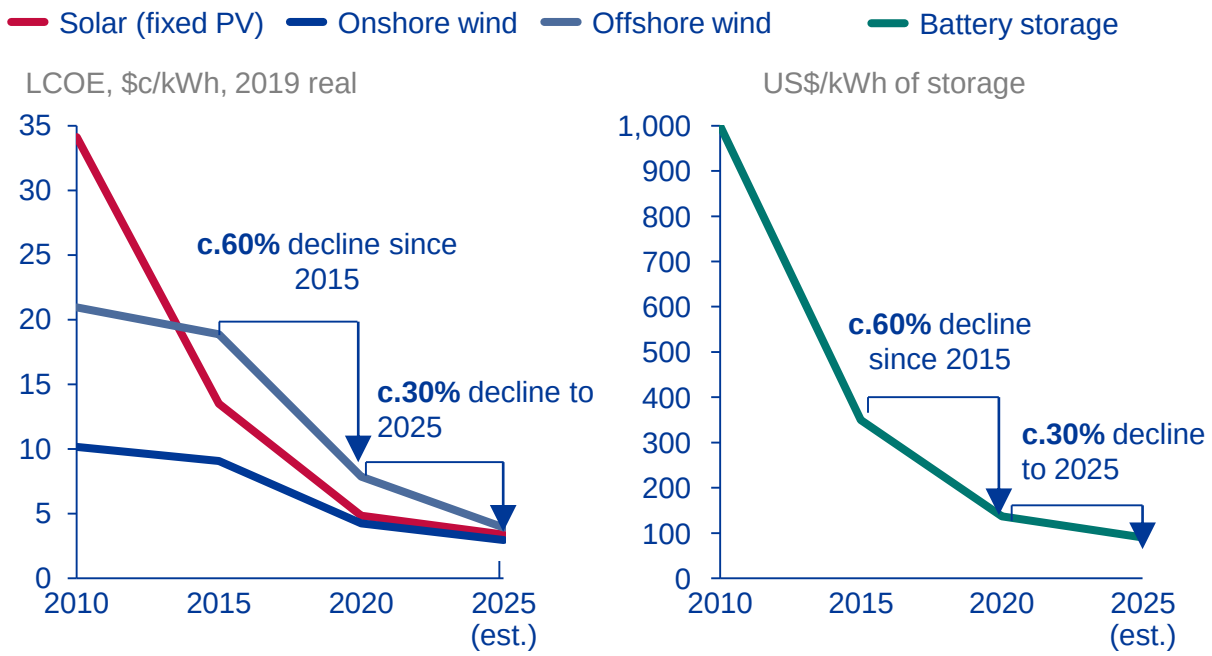
Presidential Climate Commission
30 July 2021

Changes in the macro environment impacting the electricity industry and Eskom's overall strategic direction

Environmental challenges and climate change	 Major capacity reductions anticipated to comply with MES requirements, unless amended	 Impact of adverse climate events such as drought, floods, and extreme temperatures on plant operations	 Water scarcity exacerbated by climate change, with a coal fleet that consumes > 270 000 Ml/yr.
Access to financing	 Severely constrained balance sheet with a debt burden of R401bn as at March 21	 Funders moving away from funding coal assets and towards clean energy and technologies	 Carbon border tax adjustments impacting exports and trade, domestic carbon tax impact
Changes in the macro environment impacting ESI	 100 MW decision will reduce Eskom's revenue base, but also provides opportunities for Eskom	 ESI model changing to increase competitiveness of SA industry	 Coal shortages over medium term, driving up primary energy costs

The cost competitiveness of renewable technologies, access to green financing and the idea that SA is seen as ideal presents an opportunity to address the threats

Solar, wind & battery costs saw c.60% declines past 5 years



Investors scaling up investment in SDG-related assets and clean energy

US$ 40.5 trillion

Total global ESG assets under management in 2020

US$ 1 trillion

Total global green bonds; record $269 bn issuance in 2020

Standard Chartered

Committed US$ 35 bn for clean tech and renewables

HSBC

committed US$ 100 bn for clean energy, low-carbon tech and SDGs

BNP PARIBAS

Ear-marked EUR15 bn for renewable energy investments

Cost of abatement of CO2 is US $7/ ton in South Africa compared to US $120/ton in other countries

Numerous counterparties have indicated interest to support the Eskom JET

"As discussed, we are interested to support Eskom on this important agenda"

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"…we would like to express our interest to support Eskom in the repurposing of such coal fired power stations…"

KFW Bank aus Verantwortung

"AFD is keen to accompany Eskom in the decommissioning and repurposing of some of its coal fired power stations…"

AFD Agence Française de Développement

"…setting a clear timeline of our joint work on this project would be beneficial for both NDB and Eskom to understand expectations of the parties

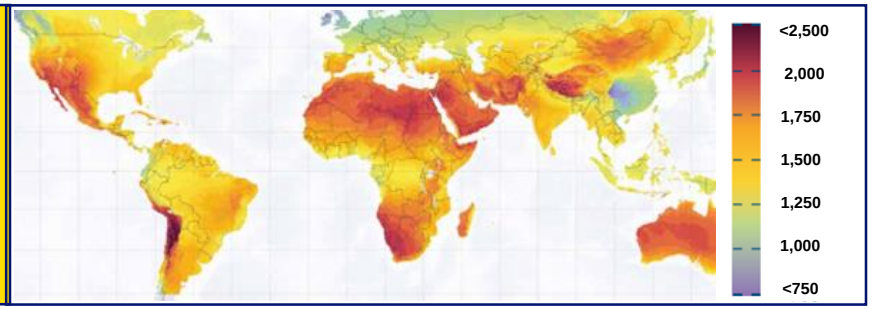
New Development Bank

Source: Discussion Materials | ESG Considerations, Goldman Sachs International, April 2021; Source: BNEF, IEEFA Asset managers leaving coal, IEEFA Finance leaving coal
"Energy smart technologies" includes smart grids, demand response, and energy storage.

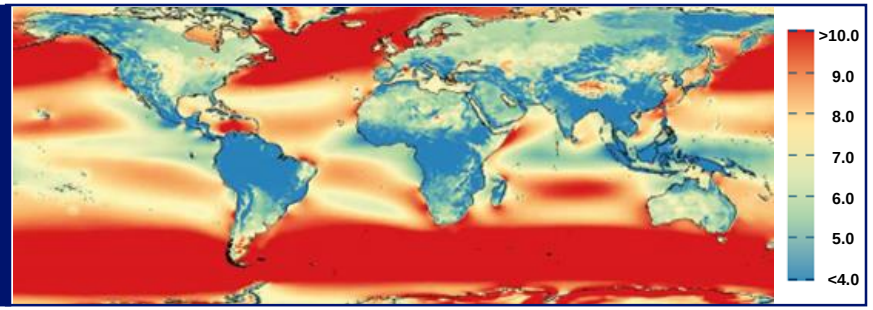
South Africa is ideally positioned to seize the opportunity given the abundance of solar and wind resources and its lower risk profile

South Africa benefits from globally-leading solar & wind resource

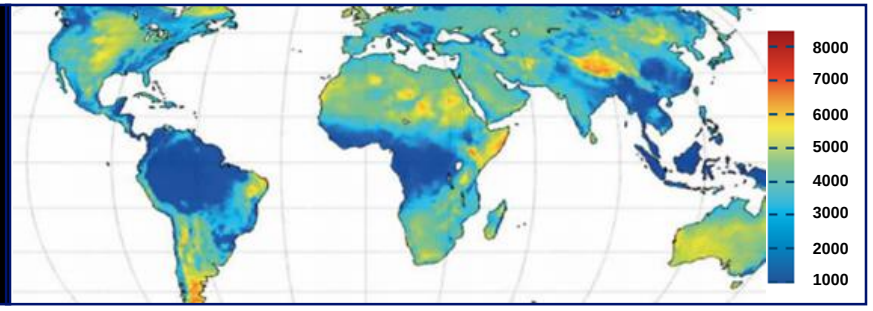
Yearly total photovoltaic power potential, *kWh/kWp*



Average wind speed, *meter per second*



Availability of combined wind and solar resources *hours / year*



South Africa's solar & wind resource is as good as that in countries setting record auction prices

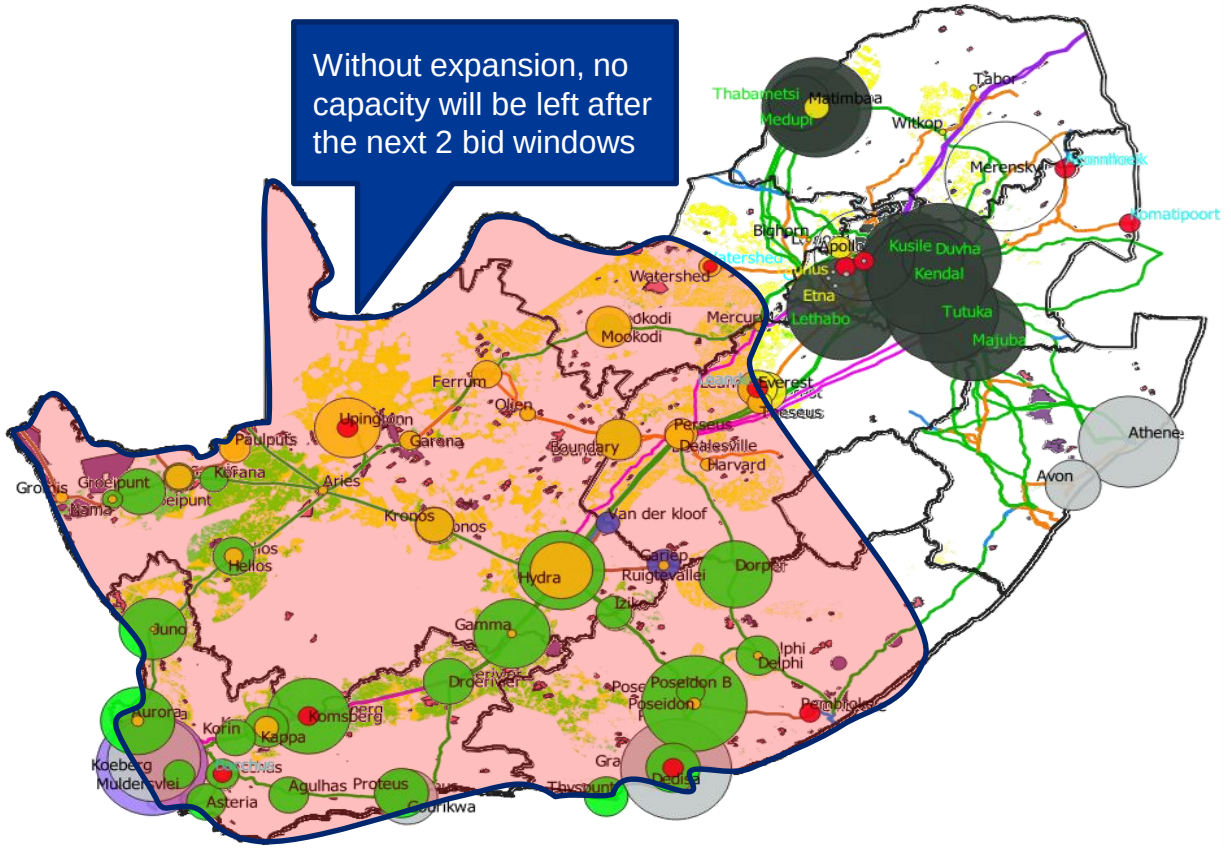
	Country with record-setting auction prices	South Africa
Solar	▪ Portugal ▪ 1.3 $c/kWh (18 R¢/kWh) ▪ **4.4 - 4.6** kWh/kWp for best 40% of land	▪ **5.2 – 5.6** kWh/kWp for best 40% of land
Wind	▪ Mexico ▪ 2.1 $c/kWh (28 R¢/kWh) ▪ **>7 m/s** mean wind speed @100m height in 10% windiest of areas	▪ **>7.5 m/s** mean wind speed in windiest 10% of areas

South Africa also offers a lower risk profile compared to India, Venezuela, Indonesia and Vietnam

Source: The World Bank (2019) Global Solar Atlas, Technical University of Denmark (DTU) Global Wind Atlas, IEA (2017) Renewable energy for industry (Adapted and based on Fasihi, Bogdanov and Breyer (2016), Techno-Economic Assessment of Power-to-Liquids (PtL) Fuels Production and Global Trading Based on Hybrid PV-wind Power Plants)

Investment in grid infrastructure is critical for connecting new generation capacity

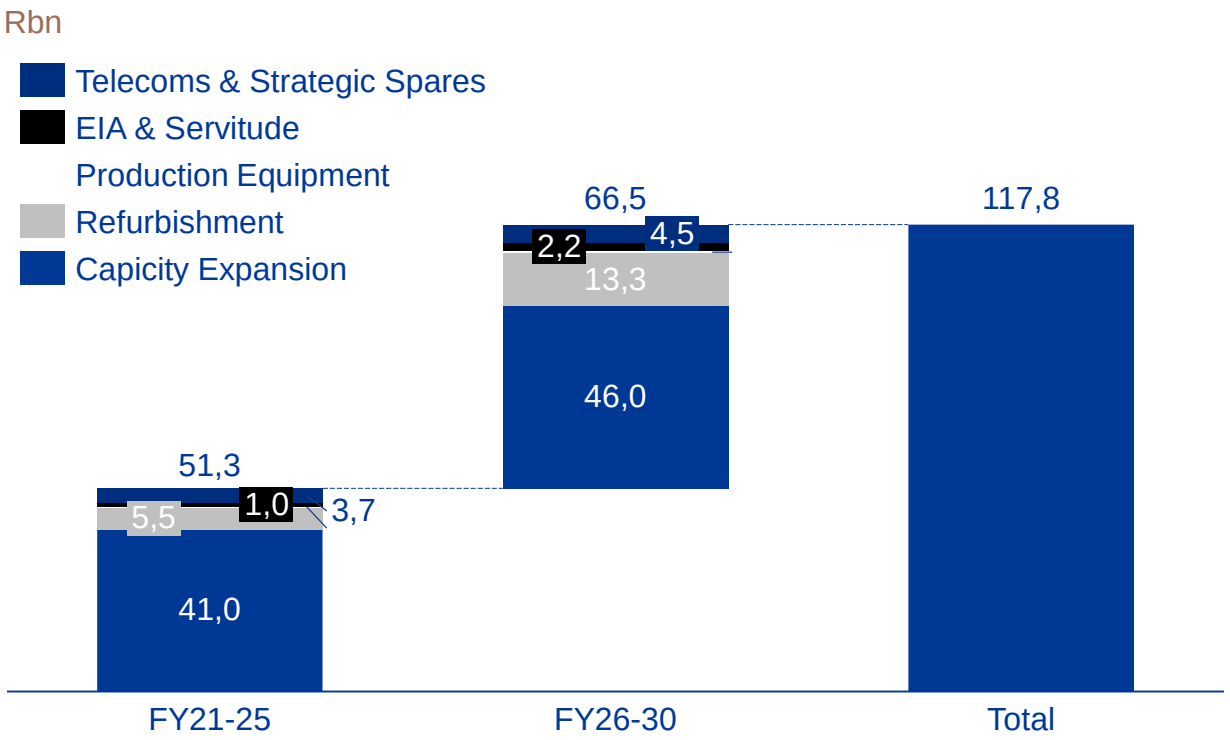
Spatial considerations for renewable capacity rollout



Transmission network is running out of capacity

- No grid capacity in the Northern Cape and very limited capacity in the Western and Eastern Cape (good wind resource areas)
- Transmission lines take about **7 years to construct limited by servitude and land acquisition**

Significant investment required to expand and sustain Transmission infrastructure



Immediate action is required to deliver the Transmission development plan:

- **Funding to support the roll out the Transmission network needs to be secured**
- Address servitude challenges e.g. Revision to expropriation legislation to allow Transmission to “fast track” the acquisition of servitude rights
- Engagements at SA INC. level (Suppliers / Manufactures / Construction Associations / NT / DTIC) to find optimal localisation and procurement process

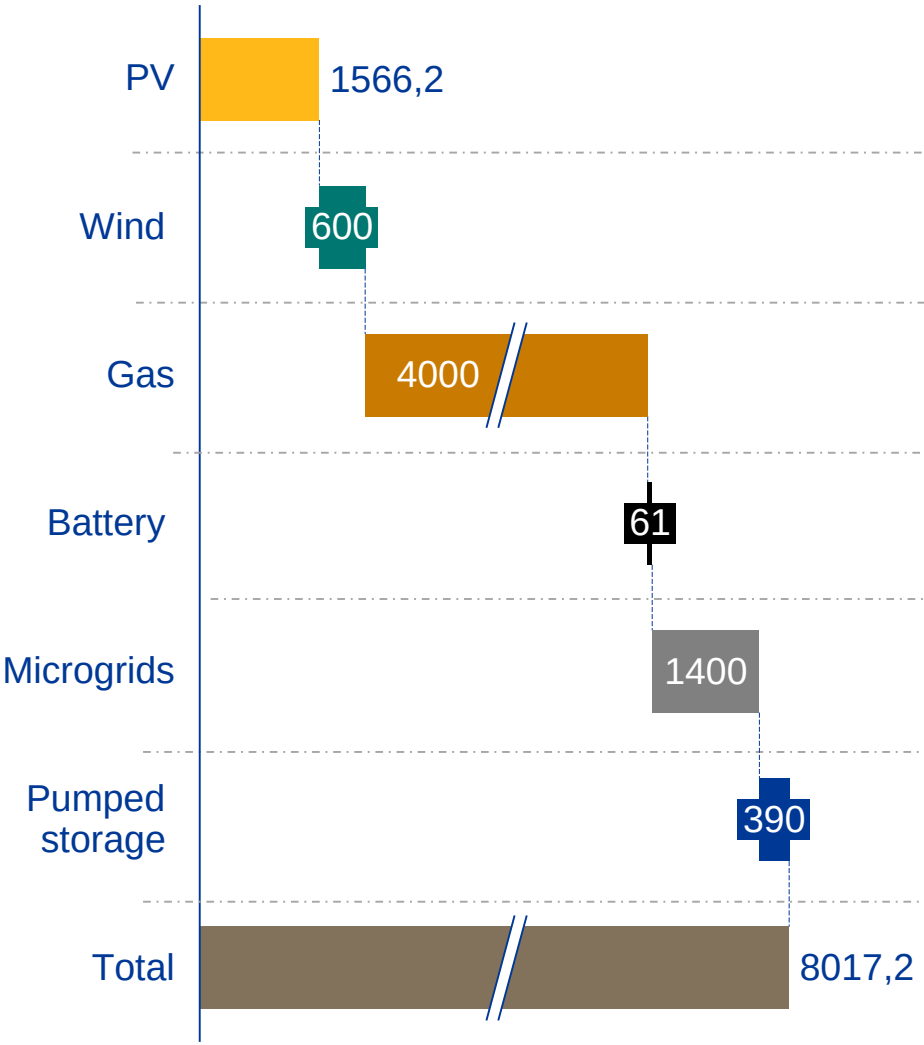
Eskom will consider technologies based on techno economic considerations

Technology Preference

Technology	Capital cost LCOE[1]	Build time	Build	Own	Operate	Comment / Eskom position
PV	• **825 $/kW** • 4,1 U$ c/kWh	• 18-24 months	✓	✓	✓	• Identified potential sites to retrofit PV to capitalise on existing infrastructure and available resources
Wind	• **1 450 $/kW** • 5,4 U$ c/kWh	• 24-36 months	✓	✓	✓	• Leverage sites for wind, with environmental authorisations to capitalise on existing infrastructure and available resources
Gas	• **1 250 $/kW*** • 7,3 U$ c/kWh	• 24-60 months	✓	✓	✓	• Intend to use gas as a means to enable renewables, thereby supporting the transition
Nuclear	• **12 500 $/KW** • 19,8 U$ c/kWh	• 12-15 years	✗	✗	✓	• Supports Government plans to roll out new nuclear, however, will be unable to build due to inadequate Eskom balance sheet
New coal	• **62 250 $/kW** • 15,9 U$ c/kWh	• 10-12 years	✗	✗	✗	• Will own and operate current coal fleet till end of life, with a focus on repurposing sites to be decommissioned with renewables. No new coal projects by Eskom

Note1. Capital cost includes EPC cost, capital cost during constriction, LCOE – levelized cost of energy; Source: Lazard 2020 costs
*Note 2: Assumed Lazard costs are pipeline gas costs (US$ 1.5-2.5) LNG costs are US$ 6-9. SA wind costs will be far more competitive

Eskom has a pipeline of projects that will benefit from concessional funding

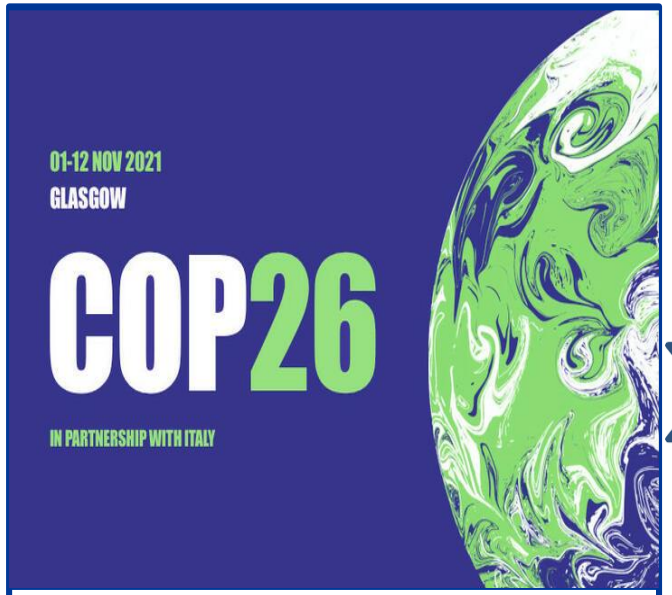


# of projects	Description
12	• 7 projects at existing coal plants ~ 382 MW • 3 phased Sere expansion ~ 600 MW • Olyvenhouts and Gamma substation ~ 585 MW
3	• Kleinzee 300 MW • Aberdeen 200 MW • Other wind projects 100MW
2	• Komati gas 1000 MW • Richards bay 3000 MW
1	• Komati battery storage 244 MWh
TBC	• 3x Containerised Microgrid installations planned till March 2022
1	• Tubatse pumped storage scheme[1]

- Other projects include clean coal technologies e.g. carbon capture and storage to replace the Majuba UCG project in collaboration with the Council for Geosciences
- Moderate additional capacity relative to total new capacity, Eskom does not intend to crowd out new IPPs
- Greater investment required in battery storage presents additional opportunities

Footnote: 1 Evaluations on Tubatse pumped storage scheme still underway

Our engagements indicate a small window of opportunity for SA to seize the moment



COP 26 taking place in November 2021 provides an opportunity for Eskom and South Africa to share just energy transition plans and secure global financial support

Investors are looking for opportunities with:

- **Clear decarbonisation targets / milestones** which provide clarity on transition - 1.5 degree trajectory (net zero carbon by 2050 and nearly halving emissions by 2030)
- **Effective governance to deliver transition** with clear accountability/ track record to meet transition milestones
- Ambitious **policies and commitments** e.g. Science Based Targets (SBT) and KPIs (e.g. EU taxonomy)
- Transition in line with or faster than relevant national/international **decarbonisation policies & regulation, and NDCs**

South Africa presents the best destination for carbon mitigation

- Investors are incentivised to find high impact projects as part of their key performance areas
- South Africa offers attractive carbon emissions abatement costs US$ 7/t vs. US$ 120 - US$ 400/t in developed countries
- Eskom to work closely with RSA government to **align plans and targets to demonstrate a shared vision at COP 26**

Developed countries committed to provide US$ 500 bn to finance transitions in emerging markets - under Paris Agreement mechanisms have to be developed to facilitate the flow of funds into emerging markets to facilitate the transition

Source: World Bank State and Trends Report

Commitments and parties to an Eskom JET financing agreement

Commitment to:

- NDC targets
- Enabling policies for energy transition and decarbonisation
- Enabling policies for reskilling and training of workers, promoting the establishment of manufacturing and service industries associated with renewable energy, and promoting small business development for vulnerable sectors

Commitments to:

- Social uplitfment, local manufacturing and reindustrialisation
- Decarbonisation and shutdown of coal plant
- Building cleaner plant
- Grid expansion and strengthening
- Unbundling of Eskom

Provides concessional financing to RSA Government and Eskom

- For Grid expansion
- Coal plant repowering and repurposing
- Greenfields, lower carbon development
- Reindustrialization and local manufacture efforts
- Social uplitfment and job creation

Eskom's Just Energy Transition (JET) financing facility

Eskom's JET Financing Facility

Concept description:

To enable and accelerate the Just Energy Transition from coal to other forms of electricity generation, we propose:

- **a multi-tranche, multi-year facility**, funded by a **multi-lender syndicate**,
- The Facility will provide **concessional funding** to JET projects in the Republic of South Africa on a **"pay for performance"** basis.
- The funds will be advanced as **progress payments** for **different stages of various projects**

Numerous counterparties have indicated interest to support the Eskom JET Financing concept

Eskom's JET plans are the most developed that we have seen worldwide

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Eskom JET work has been important for focusing the minds on what work needs to be done

Eskom's JET work provides an important platform for us to engage

The Eskom JET work is being discussed by our capitals

Safeguards

- Staggered disbursement, tranches of disbursements based on project stage gates
- Use it or lose it, protecting sterilization of funds for decarbonisation in other jurisdictions
- Performance based payments subject to achievement of agreed milestones
- Lender Group opt in or opt out, depending on technology
- RSA Government approval processes to be expedited to prevent undue delays

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The socio-economic benefits are fundamental to the objective and success of the transition

Microgrid – electrification and industrialisation

- **Accelerate electrification to 13% unserved South Africans**
- **Upskilling and training of community members** for maintenance
- **Small business creation** and industrialization opportunity
- Leveraging the power and communications system for **value added services, such as internet access for social platforms and education**

Agrivoltaics to sustain economic activity

- Projects can be **developed in areas with established grid infrastructure**, while Transmision addresses the capacity constraints in other regions
- Combining agriculture with energy generation. Lower energy derived per hectare, but **greater direct benefits for communities and Eskom.**

> 300 000 net jobs created from infrastructure roll out

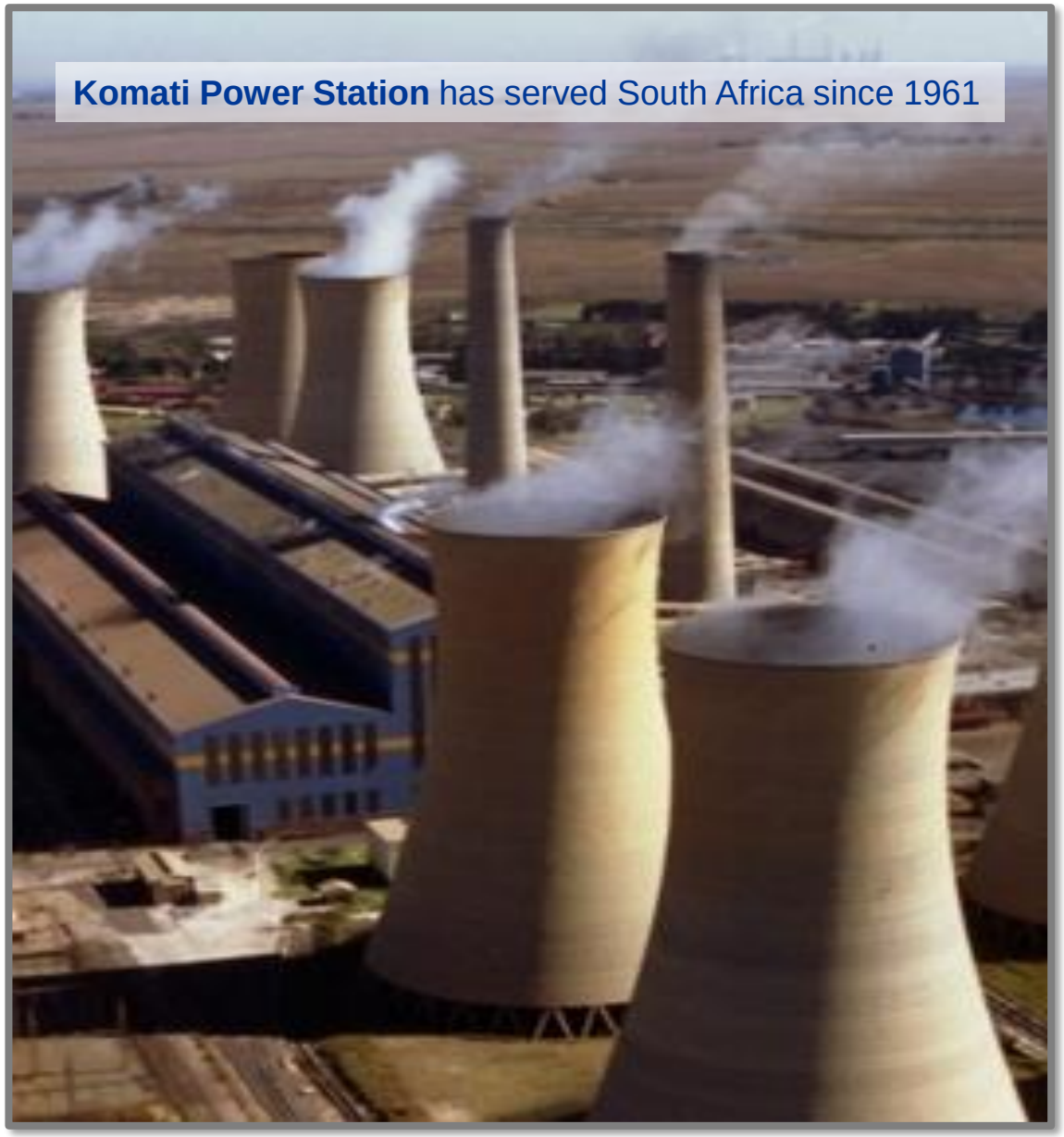
New job potential for Wind and PV during Construction, Operations and Manufacturing between 2022 and 2030

- ***~ 38 000 direct jobs created***
- ***~ 116 000 indirect jobs created***
- ***~ 192 000 induced jobs created***

- ***Job creation and manufacturing potential linked to the construction of 8000 Km Transmission lines by 2030***

Some investors have indicated an interest in utilising rehabilitated land from cost mines to accelerate projects by leveraging existing infrastructure

We have identified Komati as the flagship site to illustrate our transition ambitions



With Komati's last coal-fired unit set to be shut down in 2022, the **Komati repowering and repurposing programme offers many opportunities**

- Offers the unique opportunity to pilot the repowering of a station on existing Eskom land
- Opportunity to pilot implementation of renewable technologies, test grid performance and create knowledge base
- Ideally positioned to be a flagship grid-connected JET project with the prospect of catalysing change in the electricity supply industry in the surrounding economic nodes
- Offers the opportunity to still contribute positively to the Komati community, pilot industrialisation and local manufacture opportunities

Eskom has engagements many stakeholders on our JET plans, and welcome further engagements

Stakeholder group	Description
Communities	• **Meetings held in Emalahleni,** particularly on the impacts of plant shut-down
Business and Business Associations	• Discussion with local businesses, National business organisations and associations, including on collaboration to **support and promote localisation and industrialisation**
CSOs, NGOs, and local government	• Engagements held on **potential collaboration and integration** of Eskom JET plans with other plans being developed at local level. • Ongoing **regular engagements with government**
Employee households' survey	• **240 households** were surveyed in Pullens hope Komati and Grootvlei settlements, as part of the socio-economic impact studies
Organised labour	• **Information sharing sessions** with Generation Group Forum and Business Unit Forums to address issues related to employees and affected sites • Individual engagements **with NUM and NUMSA on social impact studies** • **Presentation of social impact study** results to the Strategic Forum, • **Strategic engagement** on the overall Eskom transition plan with **NUM, NUMSA and Solidarity** leadership

Source: Socio-economic impact study report, team analysis