Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 09-Nov-2021 | Report No: PIDC32771

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Parent Project ID (if any)	Project Name
South Africa	P177398		Eskom Just Energy Transition Project (P177398)
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
AFRICA EAST	Jun 30, 2022	Sep 30, 2022	Energy & Extractives
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	ESKOM	Eskom	

Proposed Development Objective(s)

The development objective is to support the Government of South Africa in piloting the decommissioning of coal power generation, repurposing the project areas with cleaner energy sources and mitigating the associated socio-economic impacts.

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	435.50
Total Financing	435.50
of which IBRD/IDA	250.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	250.00

Non-World Bank Group Financing

Trust Funds	50.50
Canada Clean Energy and Forest Climate Facility Trust Fund	47.50
Energy Sector Management Assistance Program	3.00

Other Sources	135.00
Foreign Private Commercial Sources (unidentified)	135.00

Environmental and Social Risk Classification	Concept Review Decision
High	Track II-The review did authorize the preparation to continue

Other Decision (as needed)

B. Introduction and Context

Country Context

The economy of the Republic of South Africa (RSA) has started to recover in 2021, supported by a favorable global environment. Recovering from last year's low base as a result of the COVID-19-related strict lockdown, GDP increased by 7.5 percent in the first half of 2021 compared with the first half of 2020, with mining and manufacturing experiencing the largest recoveries (25.2 and 17 percent, respectively). On the demand side, household consumption, changes in inventories (lower destocking), and net exports drove the increase, while investment continued to lag. The financial sector is liquid, and banks remain well-capitalized (17.9 percent as of June 2021), despite lower profitability in 2020.

Nevertheless, the impacts of the COVID-19 pandemic are still visible, especially on social outcomes. In 2020, the economy contracted by 6.4 percent, with broad-based effects across sectors. The toll on jobs was severe and has been persistent, despite the rebound in activity. In net terms, there were still 1.4 million fewer jobs in June 2021 than in March 2020. The unemployment rate has continued to increase, reaching 34.4 percent at end-June 2021. Even with the relatively strong social assistance system, poverty has increased, reversing years of progress. The poverty rate is estimated to have reached 59.8 percent in 2020 based on the upper middle-income country poverty line (US$5.5/day in 2011 PPP) compared to 57.7 percent in 2019.

RSA has benefited from favorable global financial market conditions and robust terms-of-trade gains in 2021. In the context of improving terms of trade, current account surpluses, and robust mining activity, South African rand and stock market indices have rebounded significantly from their pandemic-induced lows, while market interest rates have reverted to pre-pandemic levels, despite persistent net portfolio outflows. Risk sentiment remains sensitive to the extent that the more transmissible delta variant has hurt the pace of the global recovery and there are signs of persistent upward pressure on global inflation. But South Africa has remained broadly resilient.

The electricity sector in RSA is the most coal dependent in the G20 countries. Out of the 52 GW of installed generation capacity, coal-fired power generation represents the most important source at 74% of the installed capacity, followed by renewables (15%), oil (7%) and nuclear (3%). In 2020, the power sector produced 221.5 terawatt hours (TWh) of electricity, of which 83.5% (184.4 TWh) was from coal, 5.2% (11.5 TWh) from nuclear, 10.5% (23.7 TWh) from renewables (5.6% from wind and solar), and 1% (1.9 TWh) from diesel. The Eskom coal fleet comprises 15 power plants (all located in Mpumalanga province) with an average age of 41 years. Due to the large penetration of coal generation,

the power sector is a key contributor to greenhouse gas (GHG) emissions with 48 percent of RSA's total CO_2 emissions.

RSA is a signatory to the United Nations Framework Convention on Climate Change's (UNFCCC) Paris Agreement, which provides a framework to avoid climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C. RSA's first Nationally Determined Commitment (NDC), published in 2015, committed to a single mitigation range (398 and 614 $MtCO_2e$) for two target years (2025 and 2030). The updated NDC, published in September 2021, raises this mitigation ambition by committing to a mitigation range of between 398 and 510 $MtCO_2e$ to be achieved by 2025 and to between 350 and 420 $MtCO_2e$ to be achieved by 2030. If achieved, these targets set RSA on pace to peak its emissions by 2025. The lower bound of the new 2030 target is consistent with South Africa's fair share contribution to keeping global warming below 2°C. The upper bound of the new 2030 target is consistent with a pathway to limiting warming to 1.5°C. The NDC underscores that meeting these targets require successful implementation of the 2019 Integrated Resource Plan (IRP), in addition to the Green Transport Strategy, energy efficiency programs, and the continued implementation of the carbon tax.

The implementation of the IRP is expected to generate a substantial change in the sector's generation mix and will be a major contributor to meeting RSA's climate change targets. RSA's IRP 2019 sets out the generation capacity expansion plan up to 2030. The IRP, the first masterplan in Africa that put wind and solar as least cost technologies, calls for reducing the share of fossil fuel in its primary energy mix and scaling up of renewable energy, including 18 GW of new wind and solar PV and the decommissioning of about 12 GW of old and inefficient coal-fired power plants (6 GW by 2025) and 2 GW of energy storage. The IRP also plans the installation of 1.5 GW of new coal capacity. However, recent changes in the political landscape in RSA as well as withdrawals from financiers render it unlikely that new coal plants will be constructed. On renewables, land is abundant, and RSA has a thriving private sector and liquid domestic capital market that could quickly scale up renewables if there is improvement in the enabling environment.

Implementation of key aspects of IRP electricity sector transition will cost about US$35 billion. Massive public and private sector investments are required to implement the IRP. The World Bank estimates that, based on experience from the United States, about US$2 billion are required to decommission 12 GW of coal plants (without social mitigation). Cost estimates from South Africa's recent renewables auction indicate about US$18 billion would be required to install 18 GW of wind and solar, and international benchmark show that about US$3 billion is required for 2 GW of energy storage. Eskom estimates that it needs about US$12 billion to build relevant transmission infrastructure to evacuate mostly new renewable generation under the plan. The IRP implementation is already behind schedule and will need a consolidated effort by Government agencies, Eskom and private sector to meet targets.

Electricity decarbonization and energy transition will take decades. It will require large scale renewables but also energy storage (including hydropower and battery) and possibly natural gas to ensure power system stability. The global and national context is such that financing of new coal is very unlikely in RSA albeit planned in the IRP; alternatives to mitigate emissions from existing coal fleet are under investigation at Eskom (Carbon Capture and Storage for CO_2 and Flue Gas Desulfurization for SOx). Although clean energy resources are abundant and the land for its development is available, massive integration of wind and solar energy in replacement of coal will pose technical issues (eg. spinning reserve, transmission over long distances) that gas-to-power, pumped hydropower storage and energy storage can help mitigate. The repurposing of decommissioned Eskom coal plants into cleaner energy power generation will contribute to substantial savings on grid infrastructure.

Sectoral and Institutional Context

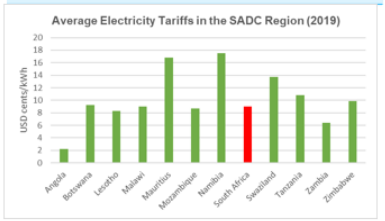
South Africa has the greatest installed capacity and annual generation in Sub-Saharan Africa; abundant conventional and renewable energy resources.

Key Electricity Sector Statistics

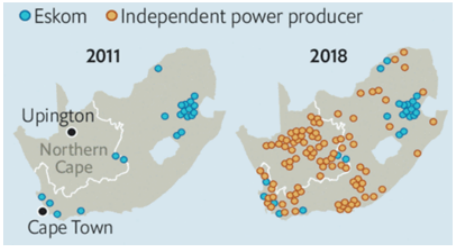
Electricity Access (2018) - %	85
Generation Capacity (Eskom AR 2020) - MW	50,293
- Thermal (coal, diesel, HFO)	40,838
- Renewables (wind, solar, hydro, CSP)	7,595
- Nuclear	1,860
Average Electricity Tariff (2019)	
- Rand/kWh	15
- US cents/kWh	0.9
Per Capita Consumption (2020) - kWh	3,950
Energy Availability Factor (Sept 2020) %	68
Electricity available for Distribution (2020) - GWh	231,356
- From IPPs	11,958
- Net imports	8,568
Transmission lines (2020) - km	33,027
Distribution lines (2020) – km	358,757
Eskom Sales (2020) - GWh	205,635
Eskom Debt (2019)	450
- Rand (billion)	27
- US$ (billion)	
Eskom Revenues (2020)	199
- Rand (billion)	13.6
- US$ (billion)	
Eskom Employees (2020)	44,772

Domestic Energy Resources

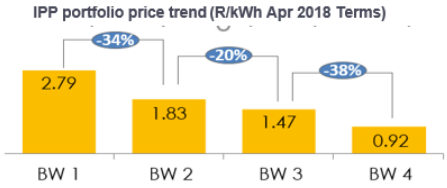
- **Coal:** World's 5th producer of coal. Recoverable reserves are estimated at 49 billion tons (6th largest). Coal is also a source of natural gas production through coal bed methane, and source of synthetic oil fuels.
- **Minerals**: Rich in diamonds, gold, iron, nickel, silver, platinoids and uranium. Only country in Africa operating nuclear plant.
- **Solar:** 2,500 hours of sunshine/year, irradiation between 4.5 and 6.5 kWh/m²/day. The Northern Cape is one of the most attractive solar resource sites in the world.
- **Wind:** Potential is estimated at 8,400 MW along the East and West coasts.
- **Shale gas:** 390 trillion cubic feet of technically recoverable gas from shale embedded in the Karoo Basin.



IPP Program



- **REIPP Program:** Competitive tender – 7 rounds & 6,400 MW
- **Installed (2020):** 63 IPP projects totaling 4,200 MW
- **IPP Price**: Bid Window (BW) 1: 2.79 R/kWh (UScents 17/kWh); BW 4: 0.92 R/kWh (UScents 55/KWh)



Major challenges facing the electricity sector: There are four key challenges the power sector in South Africa is facing: (i) recurrent load shedding due to old and poorly maintained coal fleet and overall generation shortage; (ii) unsustainable Eskom debt; (iii) remaining electricity access agenda; and (iv) implementing the Just Energy Transition (JET).

RSA faces chronic power shortages. Since 2008, RSA has been facing chronic power shortages with frequent load shedding. In 2020, load shedding accounted for about 1% of the power demand (1,798 GWh) despite a reduced load (-5.7% relative to 2019) due to COVID-related lockdown. It is estimated that the current supply gap is about 6 GW and will not be filled prior to 2024. This had negative impacts on the overall industrialization and macroeconomic development of the country. The Government has initiated several programs to increase generation capacity and narrow the electricity supply and demand gap. Those include:

- Since 2019, Eskom has embarked in a heavy generation performance improvement plan, to fix latent defects in new plants, extend life of the nuclear plant, optimize use of open cycle gas turbines (OCGTs) and pump hydro.
- *Eskom's Short Term Power Procurement Programme (STPPP):* Request for Proposal (RFP) to purchase all available capacity from industrial consumers (128 MW to be contracted in 2021)
- *Risk Mitigation Independent Power Producer Procurement Program (RMI4P*): On October 29, 2021 the Department of Mineral Resources and Energy (DMRE) announced the successful bidders under bid window 5 (see table below for results).

Outcome of Renewables Bid Window 5

Preferred bidders	25
Contracted capacity	2.583 GW
Average wind price	37.4c/kWh (UScents 2.46/kWh)
Average solar PV price	42.9c/kWh (UScents 2.82/kWh)
Total investment volume	R50 billion (US$3.3 billion)
Job opportunities	13,900
Financial closure	6 months
Province (# of projects)	Eastern Cape (2), Free State (8), KwaZulu-Natal (1), Northern Cape (7), Western Cape (7)

- *Rollout of 12 GW from IRP 2019.* Additional RFPs to be issued: 1.6 GW wind and 1 GW solar PV (bid window 6) by January 2022 (announced by DRME in November 2021). 1.5 GW from coal and 3 GW from gas in 2021. 1.6 GW from renewables (bid window 7) in 2022. (DMRE has provided the determination for those capacities by no specific announcement for tendering has been made).

Eskom's financial situation remains precarious. The financial situation remains precarious while the measures introduced by Eskom is gradually improving the overall financing position. However, without dealing with Eskom debt, the company will remain unable to pay is debt obligations without sovereign support. Financial highlights include:

- *Profitability*: Tariffs below cost-reflective levels and cost increases above inflation contributed to the degradation of profitability (e.g., EBITDA[1] margins have been below 20% since 2019, and reached 16% in 2021)
- *Solvency and liquidity:* Low profitability and an unsustainable debt burden, stemming from overreliance on debt to fund ambitious capital expansion plans in the past, have taken a toll on solvency indicators. Debt service coverage ratios have been exceptionally low, falling below 0.5 since 2019 and dropping to 0.3 in 2021. Arrears debt from municipalities have also been an increasing concern, impacting liquidity and even cash-based solvency indicators such as the cash interest coverage ratio. This indicator dipped to an alarming value of 0.85 in 2021.
- *Indebtedness*: There were slight improvement in indebtedness indicators from 2020 to 2021, largely due to government equity being channeled into debt servicing and to the strengthening of the Rand. However, indebtedness remains high for the current levels of operating profit.

Eskom's projections of cash flow movements until 2026 point towards the improvement of the financial performance, but still include government support as a means to close the cash gap in the final year of the horizon. Key measures required to improve the financial performance include:

- *Achieving cost-reflective tariffs*: Tariffs of consumers directly supplied by Eskom increased by 15.06% starting in April 2021, after the regulatory process conducted by the National Energy Regulator of South Africa (NERSA) and court proceedings involving the High Court. Although the tariff is not yet cost-reflective, this increase decisively contributes to forecasted improvements in profitability and solvency indicators in fiscal year (FY) 2022. Moreover, tariff increases ranging from 15% to 10% are an important element of the forecasts until FY 2026. Eskom identified recent discussions on possible changes to the tariff review methodology as an item to monitor closely, considering that the underlying methodology has not yet been presented by the regulator.
- *Reducing the unsustainable debt burden*: Eskom's recent achievements include reducing gross debt securities and borrowings by Rand (R) 82 billion (US$ 5.4 billion) to R402 billion (US$26.4 billion) in FY 2021, via channeling of government equity to debt repayment and as a result of exchange rate movements. Eskom clearly states that government equity injections are not a sustainable long-term solution. In these forecasts, government support decreases from R32 billion (US$2.1 billion) in FY 2022 to R23 billion (US$1.5 billion) in FY 2026.
- *Managing overdue municipal debt*: Eskom's actions in this area include improving existing revenue management processes, taking legal action to enforce the company's rights, and seeking direct agreements that would allow Eskom to act as an agent for supply and revenue collection.

Electricity access is high but universal access is not yet achieved. Since the beginning of the decade, the RSA developed a range of policies on universal access that allowed the country to fast-track the provision of electricity access. The country has made substantial progress towards achieving universal access to electricity and the percentage of the population with access to electricity is estimated at 85 percent. However, pockets of unelectrified areas are found not only in rural isolated areas but in new informal settlements nearby large metro areas. As big metros continue to attract migration (and immigration), universal access remains a government priority and part of the JET framework (currently under preparation).

[1] Earnings before interest, taxes, depreciation and amortization)

The Just Energy Transition (JET): The objective of the JET is to support the decarbonization of the minerals and energy sectors in a socially acceptable manner while contributing to the economic development of the country. The Department of Mineral Resources and Energy (DMRE) is the policy owner of the mining and energy sectors, and as such it is mandated to plan, oversee and implement South Africa's future energy mix and JET. The IRP 2019 is an important policy instrument on JET that stipulates the decommissioning of about 12 GW of coal fired power plants by 2030 and the scale up of private sector led renewables of 18 GW of the same time period. Eskom coal plant retirement plan is fully aligned with IRP19. The DMRE is in the process of defining a more detailed JET framework and KPI's to manage and monitor implementation. The DMRE JET framework will be issued for consultation in early 2022.

Relationship to CPF

The recently approved Country Partnership Framework (Report No. 154318-ZA**)** states under *Focus Area 3: Improve Infrastructure Investment Framework and Selected Infrastructure Services; Objective 3.2: Improved Infrastructure Services by Selected SOEs* that the WBG will support Eskom restructuring / government reform program to improve the operational performance and financial stability of the company to ensure electricity supply security. In parallel, the power sector reform agenda, set out along the lines of the Eskom Restructuring Power and other Government documents, includes: (a) Eskom's full legal unbundling; (b) creating competition in generation; (c) dealing with Eskom debt management and optimization; (d) improving efficiency in electricity distribution; (e) scaling up renewables; and (f) implementing the Just Energy Transition (JET).

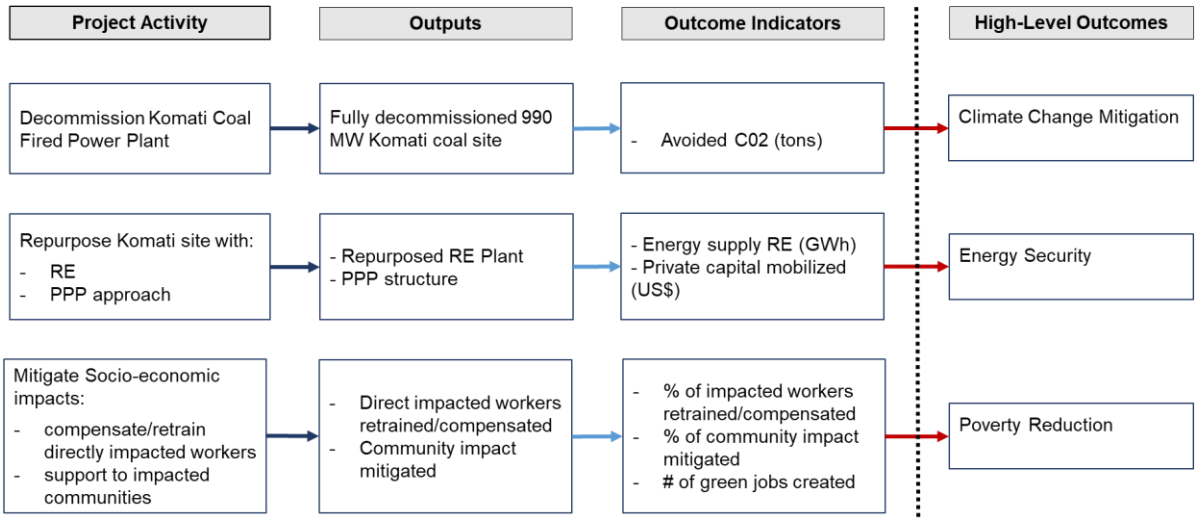
The CPF Objective Indicators include support to the JET with a baseline of no coal plants retired / repurposed (2020) and target 3 GW of retired coal plants / 1 GW repurposed with renewables and Public Private Partnership (PPP) by 2025.

C. Proposed Development Objective(s)

The development objective is to pilot Eskom's Just Energy Transition (JET) by decommissioning and repurposing the 990 MW Komati coal fired power plant.

Key Results (From PCN)

The JETP Theory of Change (ToC) sets out the project activities, outputs, outcome indicators as well as high level outcomes. The indicative table below provides the current approach requiring further fine tuning and discussions with Eskom.



Project site: Komati power station complex incl. thermal power plant, residential area, ash dam facilities, water dams etc.

JEPT activities: a) decommissioning of the Komati plant (incl. environmental mitigation); b) repurpose the Komati site with renewables (incl. environmental mitigation) and adopting a PPP approach; and c) mitigating socio-economic impacts.

JETP outputs: a) the full decommissioning of the old Komati plant (i.e. demolition) and cleaning up the site to ensure there are no environmental legacies; b) repurposing the Komati site with renewables technologies and bringing in the private sector for the financing and operation of the plant; and c) compensate directly impacted workers and communities, with a special attention to female staff and impacted women.

Outcome indicators: a) avoided annual CO2 emissions (based on 2019 Komati production data these are 2.6 million/tons per annum); b) RE energy supplied in GWh and/or private sector capital mobilized (in US$); and c) percentage of directly impacted workers compensated / retrained (disaggregated by gender) and/or number of green jobs created (disaggregated by gender); and/or percentage of community impact mitigated (to defined).

High-level outcomes: support energy security, poverty reduction and climate change mitigation.

D. Concept Description

Komati History: The first unit was commissioned in March 1961 and the last in November 1966. In 1987 it was decided to withdraw Komati coal plant from service but not to let the plant deteriorate. The plant was conserved ("mothballed") properly to return it to operations at a later stage. In the early 2000s, a decision was taken to return Komati Power Station to service to meet the growing demand of electricity. The units were returned to service starting with unit 9 on December 24, 2008. The full station was put online in 2011.

Main Technical Plant Data: The station has a total of 9 units, five 100 MW units on the east (Units 1 to 5) and four 125 MW units on the west (Units 6 to 9), with a total installed capacity of 1000 MW. Komati Units are small and have a higher operating & maintenance cost per megawatt generated compared to modern newer stations. Komati Power Station will reach its end-of-life expectancy in September 2022. The consolidated land belonging to Eskom on which the Power Station with associated services is situated is 686.95 hectares in accordance with the Land Tittle Deed.

JETP Concept: The JETP concept and design includes four main project components: (i) decommissioning of Komati power plant (including environmental mitigation); (ii) repurposing with renewables (including environmental mitigation) using a public private partnership (PPP) approach; (iii) mitigation of socio-economic impacts; and (iv) TA support to structure PPP.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

The Environmental and Social Risk Classification (ESRC) of the project is proposed as High.

Anticipated environmental risks and impacts associated with activities under Component A include: (i) generation of non-hazardous and hazardous waste; (ii) soil and ground water pollution; (iii) excessive noise, dust and vibration emissions; and (iv) community and occupational health and safety risks, including exposure and spread of COVID-19 and other communicable diseases. Activities associated with Component B are expected to be short in duration, predictable and manageable, and therefore of moderate to substantial environmental risk depending on the final repurposing technology that will be selected which are still under investigation. The impacts associated with the repurposing activities under Component B are mostly associated with the civil works; and include (i) impact on air quality due to dust, noise and

vibrations from bulk earth works, (ii) occupational health and safety risks, (iii) community health and safety risks, (iv) generation of construction waste and (vi) transportation of materials and equipment to site, and (vii) resource requirements such as water and backfill material. The main anticipated environmental impacts associated with each of the technologies include among other (i) generation of hazardous waste when reaching its end of life (PV solar and battery storage); (ii) bird and bat collision and impact on migratory routes (wind), (iii) noise and vibrations (wind); and (iv) accidental fires and explosions (battery storage). The ERR will be reconsidered at Appraisal as more information regarding risks related to legacy contamination and repurposing technology are known.

Social risks and impacts are anticipated associated with the impacts on employment and livelihood systems, access to infrastructure and public services, displacement and out-migration, social identities of coal-dependent communities and heightened vulnerabilities of excluded groups during transitions, including women, historically disadvantaged groups, migrant workers, and youth. In terms of risks associated with land acquisition and resettlement impacts, the settlements around the power station may experience a decrease in land value, businesses may become less viable and informal settlements may increase. This is particularly likely as a result of decommissioning (Component A), especially if no alternate economic activities and jobs are created under Component B and C. Further, due to the 500m buffer zone required for the wind turbines, there may also be a need for land acquisition and relocation of some households. However, the nature of these impacts will have to be determined as part of the ESIA under ESS1.

Eskom will prepare separate Environmental and Social Impact Assessment (ESIA) studies to address decommissioning (Component A) and repurposing (Component B). The ESIA study and ESMP for Component A is expected to address: quantifying the amount of waste general and hazardous that is likely to be generated during demolition and possible methods of reducing waste to landfill by recommending feasible and safe repurposing of waste; composition, concentration and extend of existing soil and ground water pollution and its likely impact on surrounding community health; detailed socio-economic impact assessment that will among others determine the extent of resettlement and livelihood impacts under the project, labor requirements as well as the presence of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities as per ESS7; cultural and heritage assessment, assessment of cumulative impacts and occupational and community health and safety.

To assess and manage environmental and social risks and impacts associated with Component B repurposing, Eskom will prepare a separate ESIA study and ESMP consistent with the requirements of the ESF, once the preferred repurposing technology or combination thereof has been confirmed. The ESIA for Component B will be proportionate to the anticipated environmental and social risks and impacts of the selected technology and will address direct and indirect environmental and social risks and impacts related to the installation, operation and decommissioning consistent with the World Bank Environmental, Health and Safety Guidelines and good international industry practices and the requirements of ESSs.

In general, the socio-economic impacts associated with the decommissioning and repurposing activities will be addressed through Component C on ?Mitigation of Socio-economic Impacts? of the project. A RAP will be prepared in line with ESS 5 should the ESIA study identify the need for any economic or physical resettlement. Likewise, the ESIA will be used to determine the relevance of ESS 7, and preparation of any IPs-focused instruments, if required. To ensure adequate stakeholder engagement from an early onset of the project, the project will also prepare a Stakeholder Engagement plan that will be publicly disclosed by ESKOM and the World Bank as soon as possible during project preparation. All relevant instruments to be prepared by the Borrower, including those identified during the ESIA studies, will be captured in an Environmental and Social Commitment Plan (ESCP) that will be disclosed by the World Bank prior to Appraisal.

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APPROVAL

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