

Government of the Republic of South Africa

ACCELERATING COAL TRANSITION (ACT) INVESTMENT PLAN FOR SOUTH AFRICA

SEPTEMBER 23, 2022



REPUBLIC OF SOUTH AFRICA



Table of Contents

Table of Contents	1
Executive Summary.....	3
1 Country Context.....	7
1.1 South Africa’s Macroeconomic and Social Overview	7
1.2 National and International Climate Strategies and Plans	9
1.3 Power Sector Overview.....	11
1.4 Mpumalanga Province and Transition Process.....	18
2 Accelerating Coal Transition (ACT) Context	21
2.1 State of Coal Mining and Coal-Dependent Energy Systems and Assets	21
2.2 Coal Transition in the Power Sector.....	23
2.3 National Policies Enabling Coal Transition.....	26
2.4 Key stakeholders	27
2.5 Role of Private Sector, Innovation and Leverage of Resources	31
2.6 Barriers to Just Transition Away from Coal.....	31
3 Program Description	35
3.1 Overview of proposed interventions	35
3.2 Enabling technologies and innovative models	38
3.3 Investment Preparation Activities	39
4 Financing Plan and Instruments.....	40
5 Additional Development Activities	43
5.1 Activities funded by other development partners.....	43
5.2 Complementary work by other development partners.....	44
6 Implementation Potential with Risk Assessment	45
7 Monitoring and Evaluation Framework	47
Annex 1. Responsiveness to ACT Investment Criteria	52
Annex 2. Assessment of Country Absorptive Capacity	55
A.2.1. Factors relevant to ACT implementation.....	55
A.2.2. Factors relevant to power system	60
Annex 3. Summary of Stakeholder Consultations.....	64
Annex 4. Development Co-Benefits	67
Annex 5. Project Concept Briefs.....	70

A.5.1. Project 1 – Retiring and Replacing Coal-based Power Generation Capacity 70

A.5.2. Project 2 – Mpumalanga Community Development Project 76

A.5.3. Project 3 – Energy Efficiency, Distributed Generation and Community Generation Programs . 82

Executive Summary

1. The Accelerating Coal Transition (ACT) Program was established by the Climate Investment Funds (CIF) in March 2021, to accelerate the transition away from coal while ensuring a holistic, integrated, socially inclusive, and gender-equal approach through its three pillars: governance, people and communities, and infrastructure. South Africa was selected as an ACT pilot country in October 2021 and invited to develop an Investment Plan (IP) in collaboration with relevant CIF partner multilateral development banks (MDBs), namely, the World Bank (WB), the International Finance Corporation (IFC), and the African Development Bank (AfDB). This IP, prepared by the Government of the Republic of South Africa (GoRSA), is a business plan proposing areas for ACT-financed investments and technical assistance, and exploring the possibility of securing complementary co-financing from bilateral, multilateral, and private sources.

2. Given the country's climate vulnerability and greenhouse gas (GHG)-intensive economy, coal transition in South Africa is essential for combating climate change. Since 1990, the national average temperature has increased at a rate that is more than twice the rate of global temperature increases, resulting in an increase in the frequency of droughts and extreme weather events^{1,2}. Despite this, the nation has relied for decades on domestic, low-cost coal, which generates nearly 90 percent of the nation's electricity. The coal power fleet in South Africa is the largest contributor to the country's greenhouse gas emissions, placing the country among the twenty highest in the world. This heavy reliance on coal has a direct impact on South Africa's economic and trade competitiveness, exacerbating its financial position, in the context of the coal transition process underway globally.

3. To combat climate change, South Africa is committed to transitioning away from coal. The Presidency mandated the Presidential Climate Change Commission (or Presidential Climate Commission, PCC) to develop a Just Transition Framework. Eskom, the national power utility, intends to decommission 6,000 megawatts (MW) of coal-fired power generation capacity by 2025. However, the country confronts the following challenges:

- a. First, this transition needs to occur despite an existing electricity supply shortfall of 4-6 GW resulting in recurrent load shedding, which has taken a toll on the South African economy. The power shortage caused by a lack of effective generation capacity during the peak load hours and the forgone consumption of wind power because of nighttime curtailments.
- b. Second, despite the anticipated economic benefits of coal transition, the impact of the transition on the affected subnational sectors and communities must be carefully addressed. The status quo is not providing relief for the existing unemployment conundrum, and the potential for job creation through transition is substantial, if managed well. However, a prudent approach is required to ensure that the industrial sectors relevant to coal production and consumptions and the communities economically dependent on coal value chain benefit from the transition, considering the country's persistent income disparities, high unemployment rates, and post-COVID-19 economic recovery.

¹ Francois Engelbrecht et. al., 2015. Environ. Res. Lett. 10 085004.

² Wolski, September 25, 2019. *Twice the global rate*, Climate System Analysis Group Blog by University of Cape Town (<https://www.csag.uct.ac.za/2019/09/25/twice-the-global-rate/>)

- c. Third, Eskom's unstable financial condition and the fiscal constraints impacting the GoRSA threaten the execution of its coal transition strategy.
- d. Fourth, the coal sector contributes significantly to the South African economy and its energy mix, but the impacts of transition will be most acute in the coal-belt, especially the Mpumalanga province and its four municipalities. Focusing on supporting workers, local communities and provincial/local government authorities impacted the most by the transition, reducing coal-dependency by diversifying the economic base, and enhancing the voice and agency of local communities, especially women, youth, workers, and other vulnerable groups, will be key to ensuring a 'just' transition.

4. To overcome these challenges, this ACT IP for South Africa sets its objective as catalyzing the country's transition away from coal in a socially inclusive manner while ensuring energy security. The plan proposes a financing package of USD 2.6 billion, including USD 500 million from the CIF, to achieve its transformative objective through the following proposed activities:

- a. Three Eskom coal-fired power plants (CFPPs) at Camden, Hendrina, and Grootvlei will be decommissioned and repurposed in alignment with Eskom's Just Energy Transition (JET) Strategy and the retired capacity will be replaced, while considering the economic, social, and environmental challenges of transition. The repurposing and the capacity replacement involves installing of renewable energy (RE) generation capacity and energy storage by public and private sector.
- b. The project will support community-driven development in the coal-dependent Mpumalanga Province to address the broader economic and social impacts of coal transition in an inclusive and sustainable manner while also strengthening the capacity of provincial and local governments to effectively transition to a green economy.
- c. ACT program will support the development of an Energy Efficiency in Public Buildings and Infrastructure Program (EEPBP) and distributed generation and community generation programs for the social and economic developments with an initial focus on the Mpumalanga Province.

5. Table ES 1 provides a summary of an indicative funding plan, whereas Table ES 2 provides an expected IP outcomes framework. More information on financing plan and monitoring and evaluation framework is to be found in Section 4 Financing Plan and Instruments and Section 7 Monitoring and Evaluation Framework respectively.

Table ES 1 Indicative ACT Financing Plan for South Africa

Investment Plan Components	ACT	(US\$ million)						
		MDB			Country Counterparts	Private Sector	Others	Total
		IBRD	IFC	AfDB				
Project 1: Retiring and Replacing Coal-based Power Generation Capacity								
Component A: Decommissioning	10	100	-	40	-	-	-	150
Component B: Repurposing and capacity replacement	230	375	70	165	300	860	-	2,000
Component C: Socioeconomic impact mitigation	110	90	-	-	-	-	-	200
Project 2: Mpumalanga Community Development Project								
Community Driven Development	100	5	-	5	-	15	30	155
Project 3: Energy Efficiency, Distributed Generation and Community Generation Programs								

EE and distributed generation	50	5	-	45	-	-	-	100
IP total	500	570	70	255	300	875	30	2,605

ACT = Accelerating Coal Transition, MDB = multilateral development bank, WB = The World Bank, IFC = International Finance Corporation, AfDB = African Development Bank, EE = Energy efficiency, IP = Investment Plan.

Table ES 2 Summary of South Africa's ACT Integrated Results Framework

ACT Program Results Statement ¹	Indicators	Baseline	Targets
CIF-LEVEL IMPACTS			
Accelerated transformational change toward net-zero emissions and inclusive, climate-resilient development pathways	GHG emissions reduced or avoided (t CO2 eq)	0	- Approximately 71 million tons from decommissioning of CFPPs over the lifetime - 153,700 tons/year from EE activities
	Number of beneficiaries of ACT investments (disaggregated by gender, age, employment status, and other vulnerability status)	0	TBD
	Volume of co-finance leveraged (USD)	0	TBD
ACT PROGRAM-LEVEL IMPACTS			
Accelerated transition away from coal powered to clean energy while ensuring a holistic, integrated, socially inclusive and gender equal just transition	Share of renewable energy generation in South Africa's power system (%)	7% ²	TBD
	Share of women participating in decision-making forums/platforms related to just transition	0	TBD
ACT PROGRAM-LEVEL OUTCOMES			
Sources of income created for affected employees through job retention or job creation	Number and percentage of employees of retired coal plants that have access to sustained income (#,%) (sex-disaggregated)	0	TBD
	Number of direct beneficiaries of income-generating schemes and economic regeneration activities linked to the green economy (#, \$) (sex-disaggregated)	0	TBD
Affected communities equipped with relevant skills for jobs of the future	Number of people trained in the renewable energy sector, medium- and high-skilled green jobs, STEM-education and relevant vocational training through ACT (sex-disaggregated)	0	TBD
	Number of new jobs created in clean energy sector (beneficiaries of new jobs disaggregated by gender, age, and other relevant vulnerable factors, with break down on long-term vs short term, formal vs informal, administrative vs. technical and managerial)	0	TBD

ACT Program Results Statement¹	Indicators	Baseline	Targets
Transition to cleaner energy sources	Capacity of existing coal power generation assets accelerated for retirement (MW)	0	2,400 MW
	Installed capacity of renewable energy for repowering (MW)	0	900 MW
	Energy rating (MWh) and power rating (MW) of installed energy storage system to support the use of clean energy as a CFPP repurposing and capacity replacement solution	0	450 MW 1,800 MWh
Other infrastructure	Annual energy savings (GWh/yr)	0	145 GWh/yr
ACT PROGRAM-LEVEL CO-BENEFITS			
Social, Economic, and Environmental Development Co-Benefits	Air-pollutants emission reduced (ton)	0	TBD

1. Results Statement and the set of results indicators are guided by ACT Program Integrated Results Framework approved by CIF Clean Technology Fund (CTF) Trust Fund Committee
2. Source: Enerdata, February 2022. Country Energy Report – South Africa.

1 Country Context

1.1 South Africa's Macroeconomic and Social Overview

Table 1 South Africa's Social, economic, and environmental Indicators

Social Indicators	
Population (2021, million)	60
Lower national poverty line (2020, percent of population)	59.8
Economic Indicators	
Nominal GDP (2020, billions of US dollars)	335
GDP per capita (2020, in USD)	5,637
GDP growth out for 2022 (%)	2.1
Unemployment (2020, percent of labour force, annual average)	29.2
Female unemployment (%)	36.4

Sources: National Treasury (2022 Budget Review), IMF (January 21, 2022. IMF Country Report No. 22/37)

1. South Africa is Sub-Saharan Africa's largest and most advanced economy, but with stagnated growth rates. Since the end of apartheid, there have been two distinct periods of economic development with the transition point coinciding with the global financial crisis of 2008. Until 2008, the economy grew robustly benefiting from the commodity super cycle and greater openness to the world which led to high growth in trade and foreign direct investment. High growth and macro stabilization gains led South Africa to reach sovereign investment grade rating in 2000. However, the less favorable global environment in the context of the Global Financial Crisis from 2008 combined with adverse domestic political, institutional, and economic factors led South Africa to lose most of the drivers of growth leveraged since 1994. The country thus experienced a decade of low growth while inequality and poverty remained persistently high.

2. It is anticipated that the country's economy will become more vulnerable regarding trade competitiveness in the near future due to its high carbon footprint. The European Union (EU) is one of South Africa's most important export markets, accounting for 19% of its total exports in 2019. EU climate regulations, such as the Carbon Border Adjustment Mechanism (CBAM), will have a significant impact on the country's trade with EU countries.³ The scope of the current CBAM proposal does not include indirect emissions, providing some relief.⁴ If indirect emissions are included in the future, South African exporters will face additional risks given the nation's reliance on coal for electricity and liquid fuels. The same risk will emerge with other trade partners because of the global trend toward decarbonization.

3. Recently, the country was hard-hit by the Coronavirus Disease 2019 (COVID-19) pandemic but showed relatively rapid recovery from a deep output contraction. It has had the highest number of infections on the continent and the quick Government response starting with a month-long lockdown implemented at the end of March 2020 bought government time to prepare for the unfolding health crisis by developing the relief measures for vulnerable people and businesses. However, this came at a high economic cost with Gross Domestic Product (GDP) having contracted by 7.0 percent in 2020. Following

³ TIPS, December 2021. European Green Deal: The Carbon Border Adjustment Mechanism and implications for South African and European Union trade, POLICY BRIEF: 6/2021.

⁴ Brill, T.R., Bodelier, M. and De Bie, E. 2021. EU Pro-posed Carbon Border Adjustment Mechanism. The National Law Review. 21 July 2021. Available at <https://bit.ly/33hofo7>

the large output contraction in 2020, growth recovered faster than anticipated in 2021, despite frequent power outages, as lockdowns were phased out and terms of trade further improved.⁵ The mining sector was supported by high commodity prices and businesses (manufacturing and some services) benefitted from a relatively strong rebound in consumption.

4. Nevertheless, the toll on employment remains severe and persistent, despite the rebound in economic activity. In net terms, there were still 1.4 million fewer jobs in 2021 than in 2020. The unemployment rate has continued to increase, though there was a 0.8 percentage point decrease from the fourth quarter of 2021, reaching 34.5 percent during the first quarter of 2022. Among women the rate of unemployment was 3.4 percentage points higher than among their male counterparts in the first quarter of 2022, highlighting that the South African labor market is more favorable to men than it is to women. Further, 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. Women are more likely than men to live below the poverty line with black women being the poorest.⁶ In terms of gender, as per the World Economic Forum's 2021 Global Gender Gap Index (GGI), South Africa ranks 18th globally and 2nd within the Southern African Development Community (SADC) region.⁷ It has made notable progress in improving the numbers of women in parliament, achieving gender parity in participation at the primary and secondary school levels and in closing the gender gap in rates of adult literacy. However, the largest and most persistent gaps remain in the areas of economic empowerment.⁸

5. There is a large gender gap in labour force participation rates in South Africa, despite narrow gender gaps in education, with the ratio of female to male labour force participation rate of just 78.8 percent as of 2019 – the fourth lowest in the SADC as of 2019.⁹ Besides the difference between men and women, women's absolute level of participation is also low – according to International Labour Organization (ILO) estimates, just 49.6 percent of women are economically active as of 2019 compared to 65.3 percent in Botswana, 60.4 percent in Lesotho, and 55.8 percent in Namibia. These lower rates of female labor force participation in South Africa have persisted over the last decade.¹⁰ Women continue to get paid 25 to 35 percent less than men even if they have the same amount of schooling and similar work experience.¹¹ Occupational segregation contributes in part to the gender pay gap—women tend to be over-represented in low paying sectors (for example private households) and underrepresented in most

⁵ The national accounts were revised using upgraded statistical measurements. Nominal GDP's level rose by about 10 percent on average relative to the previous series. However, the path of real GDP growth changed little.

⁶ World Bank. 2022. "South Africa Gender Assessment." Washington, DC: World Bank.

⁷ WEF. 2021. Global Gender Gap Report 2021. http://www3.weforum.org/docs/WEF_GGGR_2021.pdf.

⁸ WEF. 2021. Global Gender Gap Report 2021. http://www3.weforum.org/docs/WEF_GGGR_2021.pdf.

⁹ World Bank 2021, World Development Indicators. As of 25 May 2021.

<https://databank.worldbank.org/source/world-development-indicators>.

¹⁰ Statistics South Africa. 2020. Quarterly Labor Force Survey, Quarter 4 2019. Pretoria: SSA. Statistics South Africa 2021 Quarterly Labour Force survey, Quarter 4: 2020; <http://www.statssa.gov.za/publications/P0211/P02114thQuarter2020.pdf>. http://www.statssa.gov.za/?page_id=1854&PPN=P0211&SCH=7622.

¹¹ Mosomi, J. 2019. "Distributional Changes in the Gender Wage Gap in Post-Apartheid South African Labour Market." SA-Towards Inclusive Economic Development Working Paper 31.

<https://satied.wider.unu.edu/article/distributional-changes-in-gender-wage-gap-in-post-apartheid-southafrican-labour-market>.

of the higher paying sectors.¹² Nonetheless, the WEF’s Global Gender Gap report ranked South Africa first (along with 40 other countries) in terms of the proportion of professional and technical workers that are female, predominantly nurses and teachers.¹³ However, there is predominance of men in what is termed as “frontier skills,” or those that are relevant to the changing global economy.¹⁴ For example, in the context of this ACT IP, women are underrepresented in utilities’ jobs (electricity, gas and water supply)—among all the employed women, only 0.4 percent have a position in these types of jobs. One of the primary reasons for this is the lower representation of women in the Science, Technology, Engineering and Mathematics (STEM) field as they only represent 42.76 percent of all STEM students.

6. Moreover, women are less likely to own a business and this gender gap has grown over the past decade. For instance, the International Finance Corporation’s estimate suggests that MSME’s were 62 percent male-owned, and 38 percent female-owned as of 2017.¹⁵ Women continue to face barriers to entrepreneurship including a lack of financial literacy, basic skills, and limited access to finance.¹⁶

7. Women’s representation in government overall is good compared to many other SADC countries, although challenges remain in terms of substantive representation at all levels. As country experts posit, descriptive representation at the national and local levels of government does not always translate into legislative influence or substantive power in decision-making. South Africa is ranked high at number 12 in the world in terms of women’s representation in parliament although at the local government level women’s representation remains low.¹⁷ Finally, challenges associated with gender based violence remain significant and the rates of female homicide are almost five times higher than the global average.¹⁸ Accordingly, the direct costs of GBV in South Africa is estimated to be about R28.4 billion to R48.2 billion (approximately US\$2.3 to US\$4 billion) per year.¹⁹

1.2 National and International Climate Strategies and Plans

8. Sub-Saharan Africa accounts for only 4% of global GHG emissions, but the continent, including South Africa, is extremely vulnerable to the impacts of climate change²⁰. Shifting weather patterns that

¹² World Bank. 2022. “South Africa Gender Assessment.” Washington, DC: World Bank.

¹³ WEF. 2021. Global Gender Gap Report 2021. http://www3.weforum.org/docs/WEF_GGGR_2021.pdf.

¹⁴ WEF. 2020. Global Gender Gap Index, 2020. http://www3.weforum.org/docs/WEF_GGGR_2020.pdf.

¹⁵ IFC. 2018. The Unseen Sector: A Report on the MSME Opportunity in South Africa. Washington, DC: World Bank Group. https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/financial+institutions/resources/msme-opportunity-south-africa

¹⁶ World Bank. 2022. “South Africa Gender Assessment.” Washington, DC: World Bank.

¹⁷ IPU (Inter-parliamentary Union). 2019. Women in National Parliaments. Situation as of 1 February 2019. <http://archive.ipu.org/wmn-e/classif.htm>.

¹⁸ World Bank. 2022. “South Africa Gender Assessment.” Washington, DC: World Bank.

¹⁹ KPMG. 2014. Too costly to ignore—Violence against women in South Africa. <https://assets.kpmg/content/dam/kpmg/za/pdf/2017/01/za-Too-costlyto-ignore.pdf>.

²⁰ Sub-Saharan Africa also faces high climate change impact risks due to the double global warming rate it will experience, outlined in the Sixth Assessment Report of the UNFCCC’s IPCC in April 2022.

<https://www.ipcc.ch/assessment-report/ar6/>

cause droughts and flooding, threaten food production, infrastructure and rural livelihoods tied to the agriculture, fisheries, and forestry sectors. Hence, climate change poses serious threats to sustainable development. Climate variability will disproportionately affect the poor. South Africa is already a water-stressed country and future drought trends are a major cause for concern, especially for the smallholder farmers and poor households in townships and informal settlements. As a result of this socio-economic vulnerability, the country has recognized that it urgently needs to integrate efforts to reduce GHG emissions, as well as provide strategies for adaptation. Climate action can reduce risks and help deliver development objectives such as eradicating poverty and boosting sustainable growth.

1.2.1 South Africa's International Climate Change Commitments

9. Through its initial submission of the country's first Nationally Determined Contribution (NDC-2016) under the Paris Agreement, South Africa had committed to manage the country's greenhouse gas (GHG) emissions to peak by 2025, to plateau for the decade between 2026-2035 and to decline from 2036 onward.²¹ The country submitted its Low-Emissions Development Strategy 2050²² to UNFCCC, communicating its goal to reach to net-zero carbon emission by 2050. Ahead of COP-26 in Glasgow, South Africa submitted an updated NDC (NDC-2021) to the UNFCCC in September 2021, which strengthened the country's absolute GHG commitment from between 398-614 Mt CO₂ eq indicated for the period 2021-2030 to an updated commitment of between 398-510 by 2025 and a range of 350–420 MtCO₂e (incl. LULUCF) by 2030.²³ South Africa's NDC emphasizes the need for financial support by the international community as specified from the Paris Agreement.

1.2.2 South Africa's Response to Climate Change

10. South Africa is a leader in the transition to a low-carbon and socially inclusive future. The government's recent announcements and documents related to infrastructure development strategy, economic reconstruction, and post-COVID-19 recovery place importance to the significance of green, resilient, and just recovery²⁴. The country has adopted a National Development Plan, which includes a lower carbon chapter incorporating a Just Energy Transition (JET) to ensure that its transition to a low-carbon economy is based on the priorities of social inclusion, gender equality, poverty alleviation, and job creation.

11. South Africa's Integrated Resource Plan 2019 (IRP-19), which was developed by the Department of Mineral Resources and Energy (DMRE), sets out a pathway for the country's optimal electricity capacity

21 <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa.pdf>

22

<https://unfccc.int/sites/default/files/resource/South%20Africa%27s%20Low%20Emission%20Development%20Strategy.pdf>

23

<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa%20updated%20first%20NDC%20September%202021.pdf>

24 <https://www.bloomberg.com/news/articles/2022-07-25/south-africa-to-open-floodgates-for-private-power-generation>

https://ec.europa.eu/commission/presscorner/detail/en/IP_21_5768

<https://www.mining.com/web/eskom-considers-7-2-billion-in-wind-and-solar-investment-by-2030/>

expansion plan up to 2030. The IRP-19 calls for reducing the share of fossil fuel in the country's primary energy mix by decommissioning 12 GW of old and inefficient CFPPs, scaling up renewable energy by an ambitious 18 GW and 2 GW of energy storage in the timeframe until 2030, including by optimizing the nexus between energy and water.²⁵ The IRP will be updated in 2023 as the Eskom unbundling process is implemented. In addition, the GoRSA also plans to use other tools, including sector emission and energy efficiency targets, firm-level carbon budgets, and scaling up carbon capture and storage as key levers for carbon emission reduction.

12. In September 2020, President Cyril Ramaphosa and the Cabinet established the Presidential Climate Commission (PCC), an independent, statutory, multi-stakeholder body to oversee and facilitate a just and equitable transition toward a low-emissions and climate-resilient economy. South Africa has adopted a national climate change response policy that also includes several adaptation plans, mainstreamed across sectors and different government tiers, with strong institutional framework for coordination, monitoring and reporting. An Inter-Ministerial Committee and Presidential Climate Finance Task Team (PCFTT) have been established to undertake the preparation of an Investment Plan for a Broader Just Transition Project under the JETP. The CIF-ACT IP is dovetailing with the JETP Investment Plan to avoid parallel processes. The CIF-ACT IP will feed essential inputs into the broader JETP IP. A climate change bill has been adopted by South Africa's Cabinet and tabled to the country's Parliament, where, once agreed, it will give legal credence to many of the sectoral policies and guidelines adopted.

13. Overall, the strong National commitments to climate change and concrete plans regarding coal phase down provide sound foundation for the implementation of the ACT investment plan.

1.3 Power Sector Overview

14. To achieve its climate change objectives, actions in the energy sector would be key given its significant contribution to the emissions. In particular, actions within the power sector would be critical as decarbonization solutions available today are most feasible in the supply of electricity than in other part of the energy sector. Accordingly, decarbonization of the power sector is a priority for the country and also the focus of this investment plan. At the same time, the broader Just Energy Transition Investment plan that is being prepared by the Government will focus on the other parts of the energy sector as well.

1.3.1 Institutional and Regulatory Framework

15. In South Africa, the electricity sector is principally governed by the provisions of the National Energy Regulator Act, 2004 (NERA), the Electricity Regulation Act, 2006 (ERA), and the National Energy Act, 2008 (NEA). The sector comes under the purview of the Department of Mineral Resources and Energy (DMRE) which is headed by the Minister for Mineral Resources and Energy (Minister).

16. The South African electricity sector is dominated by Eskom, the state-owned vertically integrated utility. In addition to generating 85 percent of the domestic production, Eskom is also responsible for international trade of power and government-mandated power purchase from private generators. The utility also owns more than 30,000 km of transmission lines, along with multiple substations and related assets. As the sole transmission licensee and system operator in South Africa, Eskom fulfills multiple duties such as providing transmission network service and ensuring the short-term reliability of the country's

²⁵ DMRE, *Integrated Resource Plan 2019*, Available online: <http://www.energy.gov.za/IRP/2019/IRP-2019.pdf>

power and compliance with the Grid Code. Although municipalities are responsible for the distribution of electricity within their boundaries, Eskom acts as the sole or joint final distributor in over 90 municipalities. Wherever Eskom is not the sole final distributor, the utility supplies power to the licensed distributor at a bulk supply tariff. Thus, Eskom supplies power directly to 40 percent of the country's end-users²⁶.

17. Eskom's dominance in the sector has prompted the need for regulatory oversight, which is fulfilled by the National Energy Regulator of South Africa (NERSA). Although the electricity sector comes under the direct purview of DMRE, other ministries including DFFE and DPE also have the power to effect changes in the sector. Incidentally, DMRE also oversees the policy environment for the coal value chain. Independent power producers (IPPs), municipalities and consumers are also important stakeholders in the electricity sector. Laws, regulations, and other policy instruments such as the IRP, are drafted by the concerned ministry and feedback from the public is solicited on the same. Based upon the comments received, the final version is drafted and, after fulfilling statutory requirements, if any, comes into effect. Figure 1 summarizes the market participants and authorities in the electricity sector.

²⁶ Black & Veatch, 2022. Technical and Financial Approaches to Repurpose Coal Assets: Case of India, Indonesia and South Africa, work in progress

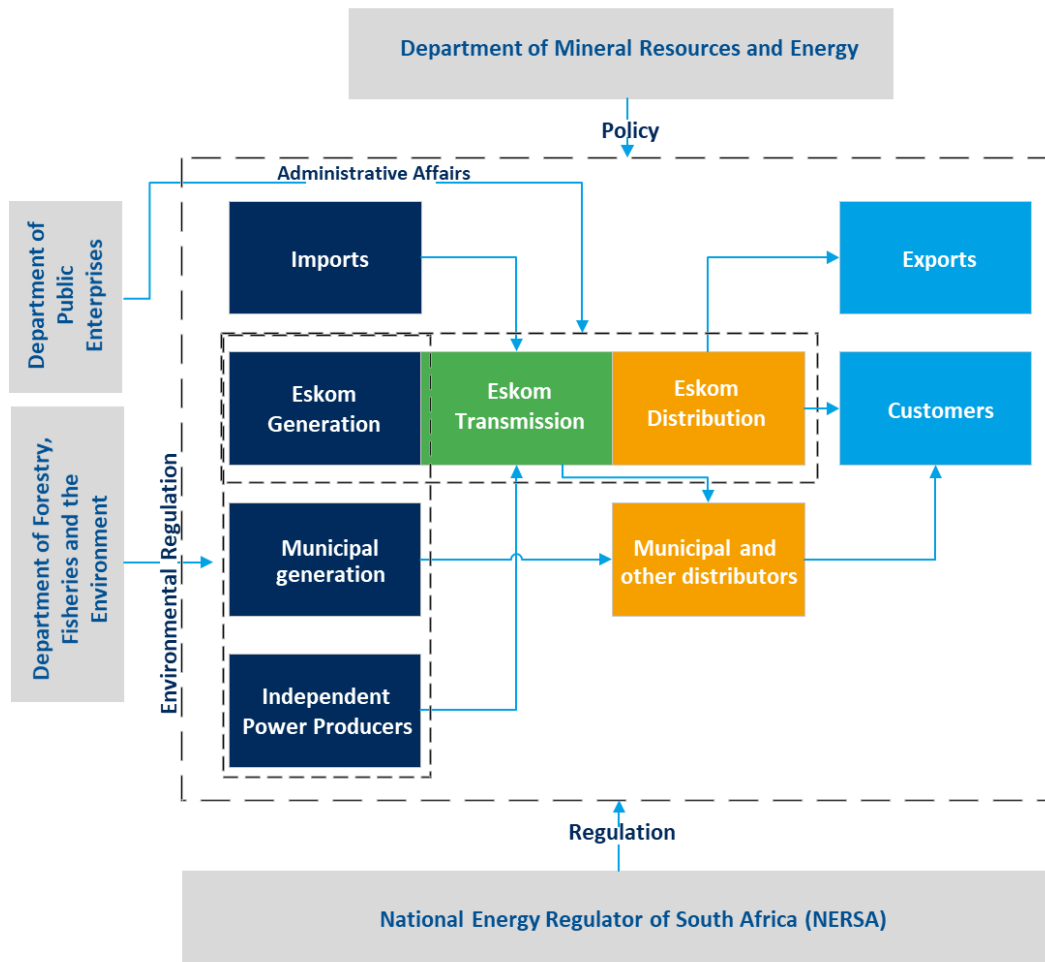


Figure 1 Overview of the Electricity Sector in South Africa (Source: Black & Veatch, 2022. Technical and Financial Approaches to Repurpose Coal Assets: Case of India, Indonesia and South Africa, work in progress)

1.3.2 Capacity mix and electricity generation mix

18. Out of the 52 GW of installed power generation capacity, coal-fired power generation represents the largest source at 74 percent of installed capacity, followed by renewables (15 percent), oil (7 percent) and nuclear (3 percent). In 2020, the power sector produced 239 terawatt hours (TWh) of electricity, of which 88 percent (210 TWh) was from coal, 5 percent (12 TWh) from nuclear, and 7 percent (17 TWh) from renewables (4 percent from wind and solar). Given its high share of GHG emissions, decarbonizing the power sector is key to South Africa’s ability to meet its commitments under the Paris Agreement.

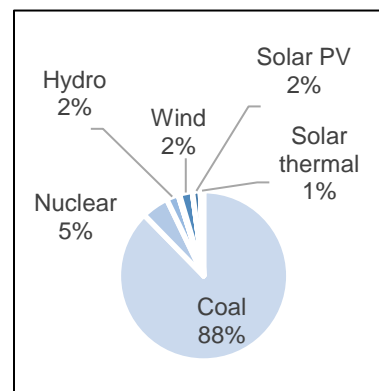


Figure 2 Electricity generation by source in 2020 (Data source: IEA)

1.3.3 Major challenges in the electricity sector

19. There are four key challenges the power sector in South Africa is currently facing: (i) recurrent load shedding; (ii) unsustainable Eskom debt not only affecting its operations, but also its capacity to maneuver

the coal transition; (iii) implementing the Just Energy Transition (JET); and (iv) electricity access.

20. Power shortage and load shedding:

Since 2008, South Africa has been facing chronic power shortages with frequent load shedding due to insufficient peak power generation capacity (seasonal and daily) and sudden losses of capacity due to the poor state of coal plants. 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. From January to July 2022, Eskom has implemented 84 days of power cuts, including so-called stage 6 loadshedding which removes 6,000 megawatts from the grid, already exceeding last year’s total number of hours in load shedding. It is estimated that the current on-grid power supply gap is between 4 and 6 GW and will not be filled prior to 2024. The unreliable electricity supply is weighing on output and business confidence. South Africa's economy contracted 1.1% in the second quarter, partly due to more extensive blackouts, according to the central bank²⁷.

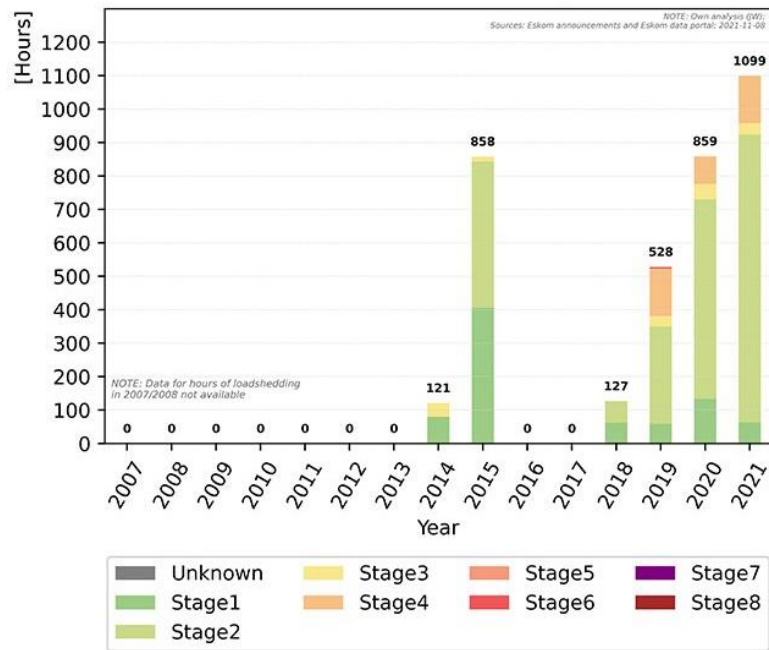


Figure 3 Hours of loadshedding (Source: Creamer Media’s Engineering News)

21. There are several Government and Eskom programs to increase generation capacity and narrow the electricity supply and demand gap. Those include:

- a. Since 2019, Eskom has embarked on a generation performance improvement plan to fix latent defects in new plants and optimize use of open cycle gas turbines (OCGTs) and pumped hydropower. Eskom is implementing a comprehensive maintenance program for performance improvement that will help reduce load shedding and improve security of power supply. Once the maintenance program for the older CFPPs has been completed and the new mega CFPP projects (Medupi and Kusile) come on-line, the overall energy availability factor (EAF) is expected to rise from 65 percent to a projected 85 percent.
- b. *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)
- c. *Risk Mitigation Independent Power Producer Procurement Program (RMI4P)*: In July 2020, DMRE launched the procurement of 2,000 MW of emergency generation to be commissioned within 24 months after contract signature, to respond to the urgent

²⁷ Bloomberg.com, “South Africa to Suspend Power Cuts For First Time in Five Weeks,” (<https://www.bloomberg.com/news/articles/2022-07-22/south-africa-to-suspend-power-cuts-for-first-time-in-five-weeks#xj4y7vzkg>)

capacity shortfall. Among the eight bidders awarded in March 2021, the cheapest offer was using solar PV and battery storage technologies, which were more competitively priced than bids for thermal plants. Among those, Scatec's three Kenhardt projects with total solar capacity of 540 MW, battery storage capacity of 225 MW/1,1,40 MW, and 150 MW of dispatchable power reached financial close and started the construction in July 2022²⁸.

- d. *Renewable Energy Independent Power Producer Procurement Program (REI4P)*: On October 29, 2021, DMRE announced 25 successful bidders under REI4P Bid Window 5. DMRE announced Bid Window 6 in April 2022 with bids expected in August 2022 for 1.6 GW wind and 1 GW solar PV. An additional 1.6 GW from renewables (Bid Window 7) and 513 MW of battery storage is expected to be issued subsequently.
- e. *Nuclear Power*: The Department of Energy has also confirmed South Africa's intention to proceed with a nuclear energy expansion program and Eskom intends to extend life of the existing nuclear power plant until 2045.

22. On July 25, 2022, President Ramaphosa announced five additional actions to address the ongoing electricity crisis. First, Eskom will improve the performance of Eskom's existing fleet of power stations by increasing the budget allocation for critical maintenance and recruiting skilled personnel. Second, the procurement of new generation capacity from renewable, gas, and battery storage will be accelerated. Third, the GoRSA will increase private investment in generation capacity by remove the licensing threshold for embedded generation completely. Fourth, the government intends to enable businesses and households to invest in rooftop solar. Lastly the electricity sector will be fundamentally transformed for future sustainability by restructuring Eskom and establishing competitive electricity market. Sub-section 1.3.4 *Power sector reforms to overcome the challenges* provides more detailed information on the third and fifth actions.

23. Eskom's **unsustainable debt and precarious financial health**: Tariffs below cost-reflective levels and cost increases above inflation contributed to the degradation of profitability of Eskom (e.g., earnings before interest, tax, depreciation and amortization (EBITDA) margins have been below 20 percent since 2019 and reached 16 percent in 2021). 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. Debt arrears 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. There was 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 South African Rand. However, indebtedness remains high for the current levels of operating profit. Standard & Poor's Global Ratings downgraded Eskom's credit rating to CCC+, reflecting a high probability of default.

24. **Just Energy Transition (JET)**: The goal of the JET is to support the decarbonization of the mining and energy sectors in a socially acceptable manner while contributing to the nation's economic growth. As the policy owner for the mining and energy sectors, DMRE is mandated to plan, oversee, and implement the future energy mix and JET for South Africa. In the power sector, the IRP-2019 is an important policy instrument that defines the energy transition path until 2030, mandating the decommissioning of

²⁸ Scatec, 2022. <https://scatec.com/2022/07/19/scatec-is-starting-construction-of-solar-and-battery-project-in-south-africa-after-reaching-financial-close/>

approximately 12 GW of coal-fired power plants by 2030 and the expansion of 18 GW of private sector-led renewables over the same time frame. The Eskom coal plant retirement plan is in complete accordance with IRP 2019 except for Tutuka power station which will be shut down earlier than planned in IRP 2019. DMRE's JET framework to provide the structure for monitoring and managing the socioeconomic effects of the energy transition has been approved by the Minister after stakeholder consultation held in December 2021, and will move toward the approval by the Cabinet.

25. One of the greatest challenges for the power sector in JET planning and implementation is to find the appropriate balance between energy security, existing labor market challenges and meeting the country's climate change mitigation commitment. These priorities need to be optimized by focusing on the supply of reliable and affordable supply of electricity to stimulate economic development, meeting the country's climate change targets and NDC commitments, mitigating socio-economic impacts, particularly on vulnerable groups, and reducing the coal dependency of local economies, in Mpumalanga and other coal-dependent provinces.

26. **Universal Energy Access:** Since the beginning of the decade, GoRSA has developed a range of policies on universal access that allowed the country to fast-track the provision of electricity access.²⁹ Since then, 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 84.39 percent in 2020. However, pockets of unelectrified areas are found not only in rural isolated areas but in new informal settlements near large metro areas. Further, the free basic electricity (FBE) of 50MWh per household per month is deemed to be inadequate for most household usage, including cooking and washing which is generally considered women's responsibilities. As big metros continue to attract migrants from inside and outside the country, universal access remains a government priority. Accordingly, alternate forms of energy access is being explored—the containerized micro-grids that Eskom is planning to roll-out in the unelectrified areas of the country, is an example.

1.3.4 Power sector reforms to overcome the challenges

27. New investment in electricity infrastructure had been stymied for many years by regulatory constraints, and slow reforms over time have only gradually allowed limited participation for the private sector. The vertical integration of Eskom's operations across the entire electricity sector had, historically, resulted in a notable lack of transparency and accountability. The generation sector faces severe inefficiencies due to lack of competition and low operational performance due to an under-maintained, aging coal fleet. The transmission sector faces an aging infrastructure and large investment requirements. The distribution business faces economic and technical problems due to highly fragmented retail markets, aging infrastructure, underfinanced municipalities, and regulatory and governance uncertainty.

28. **Unbundling of Eskom:** Eskom's vertical integration across the entire electricity sector has resulted in a number of inefficiencies. The generation sector lacks competition, and the operational performance is poor. Significant investments in transmission infrastructure are backlogged. There are economic and technical problems in the distribution sector due to a highly fragmented retail market, aging infrastructure, and regulatory and governance uncertainties.

29. In October of 2019, the Cabinet approved the Roadmap for Eskom in a Reformed Electricity Supply Industry, which outlines the plan to split Eskom into three state-owned entities for generation,

²⁹ National Planning Commission, 15 August 2012. National Development Plan 2030: Our Future-make it work, ISBN: 978-0-621-41180-5.

transmission, and distribution. Eskom has established National Transmission Company of South Africa SOC Limited (NTCSA), a wholly-owned subsidiary, and is on track to separate its generation and distribution businesses by the end of 2022. Soon, the GoRSA will appoint boards for transmission and generation entities³⁰.

30. **The exemption from a generation license:** Subject to specified exemptions set out in Schedule 2 of the ERA, no person may operate any generation, transmission or distribution facility in South Africa without a license issued by NERSA. On 10 June 2021, President Ramaphosa announced the government's approval of an increase in the threshold for generation license exemptions for generation projects from 1MW to 100MW. Further on 25 July, 2022, it was announced that the government will lift altogether the 100 MW license-exemption cap on distributed generation plant being developed by miners and heavy industry. The first reform, which was announced in June 2021, had already stimulated 80 confirmed private sector projects with a combined capacity of over 6 000 MW.

31. **From Eskom single buyer model to a wheeling market:** In the past, under the REI4P and RMI4Ps, IPPs had been limited by their ability to generate and sell power only to a single buyer, Eskom. The only exception was small-scale embedded generators which needed to apply for a license to generate up to 1 MW to a captive customer other than Eskom. Municipalities had also been limited in their ability to procure electricity from private producers. The reform will break Eskom's monopoly as the single buyer in the market and allow IPPs to sell power directly to buyers.

32. With South Africa's wheeling market in its infancy, large-scale industrial power consumers are currently best positioned to benefit from wheeling agreements – from mining operators, data centers, property portfolios and industrial operations to automotive manufacturers. Key advantages of this energy model include up to 50 percent cheaper tariffs than traditional grid prices for direct Eskom clients, a reduction in carbon tax and carbon emissions through the use of clean energy such as wind and solar PV, higher penetration due to a Time of Use credits system; and no capital requirements.

33. In addition, as part of its JET programme, Eskom is supporting the country's decarbonization efforts while at the same time strengthening the electricity grid in the Northern and Eastern Cape provinces, as a key enabler for the roll-out of new renewable capacity in these areas. The energy wheeling frameworks and tariffs are unlocking the potential for significant private sector investment in renewable energy generation by removing some of the geographical location-based limitations and addressing the customers' commitments towards renewable energy consumption by 2030. Wheeling is already used successfully in a few local projects and there are wheeling frameworks already in place for various municipalities across the country.

34. According to the Electricity Regulation Act and NERSA's Transmission Grid Code and Distribution Network Code, all customers, including transmission and distribution connected generators and loads, are provided non-discriminatory access to the grid to allow for energy to be delivered or exported. However, third party wheeling of energy is currently subject to the buyer being connected on a medium-voltage (MV) or higher-voltage networks and being on a time-of-use (TOU) tariff.

35. **Tariff and Pricing Reform:** In February 2022, the DMRE published the draft Electricity Pricing

³⁰ Address to the nation on energy crisis by President Cyril Ramaphosa, July 25, 2022 (<https://www.gov.za/speeches/president-cyril-ramaphosa-address-nation-energy-crisis-25-jul-2022-0000>)

Policy (EPP)³¹ for public comment. This proposal seeks to provide general pricing principles as well as the wholesale and transmission pricing structure while balancing affordable electricity tariffs for low-income consumers along with a cost-reflective tariff for others³².

1.4 Mpumalanga Province and Transition Process

1.4.1 Socio-Economic Profile

36. The Mpumalanga province, situated towards the east of South Africa, is the second smallest province in country but contains almost half of its high potential arable land. The province shares international borders with Eswatini to the southeast and Mozambique to the east. In 2020, the population of Mpumalanga amounted to approximately 4.7 million individuals (approximately 7.8 percent of South Africa’s total population) with labor force participation rate of 53.4 percent. The provincial population predominantly comprises individuals aged between 15 and 64—approximately 65 percent of the provincial population in 2020. Over the years, the province has experienced increasing migration from countries such as Mozambique and Eswatini linked to the high demand for unskilled labor in the mining and agriculture sector.³³ Between 2010 and 2020, the province’s working-age population increased at an average annual rate of 1.8%, which is slightly higher than the 1.5% growth rate recorded nationally over the same period.

37. Since most of the provincial population is of working age, there exists significant human resources for future economic growth and sustainability, provided there is the availability of economic opportunities to absorb the labor supply. However, this human resource potential is yet to be harnessed. Mpumalanga has low educational attainment, i.e., 11% of the population hold a post-matriculation qualification. During the first quarter of 2021, the unemployment rate in Mpumalanga stood at 33.5 percent against the national unemployment rate of 32.6 percent during the same period.³⁴ Likewise, the youth unemployment in Mpumalanga in the fourth quarter of 2020 was 47.6 percent against the national rate of 45.3 percent.³⁵ Mirroring the trends in the coal sector globally, female labor force participation rate is quite low—at present, Eskom employs 31 percent females and coal mines employ 21 percent females in Mpumalanga. Notably however, these female employees have higher educational attainment than their male counterparts (e.g., 67% of females compared to 49% of males at Eskom hold a post-matric qualification) as a result of which, females hold higher positions despite being underrepresented in absolute terms.³⁶ Most of the formal sector workers in the coal mining sector are Black South Africans (82 percent), male (83 percent) with above average levels of education (70 percent have completed at least secondary education) and unionized (60 percent). These workers support an average of three dependents each.

38. In 2020, the Mpumalanga provincial economy was valued at approximately USD 21 billion and contributed 7.2% to the national economy during the year.³⁷ The primary contributors to the economy of

³¹ <https://d1jbg4la8qhw2x.cloudfront.net/wp-content/uploads/2022/02/EPP.pdf>

³² <https://www.esi-africa.com/industry-sectors/finance-and-policy/far-reaching-amendments-available-for-public-comment/>

³³ Provincial profile: Mpumalanga / Statistics South Africa 2018

³⁴ <https://www.statssa.gov.za/publications/P0211/P02111stQuarter2021.pdf>

³⁵ Quantec EasyData 2021

³⁶ https://www.cobenefits.info/wp-content/uploads/2022/01/COBENEFITS-Study_From-coal-to-renewables-in-Mpumalanga.pdf

³⁷ Mpumalanga was the fifth largest contributor to the national economy. Quantec EasyData 2021

the province are mining (24 percent) and manufacturing (22 percent).³⁸ The potential for expanding the economic base, reducing coal dependency and diversifying the economy, are significant. For instance, the key economic nodes in the province (i.e., eMalahleni, Steve Tswete, Mbombela, Secunda, Ermelo) are connected by a vast network of roads; the province is also close to key markets in Gauteng and has linkages with Mozambique via the Maputo corridor and to the deep-water port of Richards Bay in KwaZulu-Natal. These features of Mpumalanga's location and close access to key markets creates an advantageous environment for economic diversification, growth and development.

1.4.2 Coal Activity in Mpumalanga and Potential Impacts on Socio-Economic Profile of Communities

39. Mpumalanga is rich in coal reserves and approximately 80 percent of South Africa's coal is sourced from the province while 93 percent of South Africa's coal miners, i.e., 90,000 thousand people are based in the province. Coal activity is however geographically concentrated, most of the coal reserves are concentrated in the west and southwest of the province and four municipalities, namely eMalahleni, Steve Tshwete, Msukaligwa, and Govan Mbeki. These areas account for the majority (68 percent) of all coal mining employment, contributing to 70 percent of South Africa's total value added in coal in 2019.

40. In total, the coal industry provides direct and indirect employment to approximately 250,000 thousand people, most of whom, as mentioned above are in Mpumalanga province. Beyond the direct jobs provided by the coal sector, coal mines and related industries also have positive spillover effects in terms of employment generation in Mpumalanga's non-mining sectors, especially in the transport sector (around 15,000 jobs) and service sectors.

41. According to current estimates, the decommissioning process is estimated to result in net job losses in the province by 2030. Specifically, in the IRP 2019 scenario (10.7 GW decommissioned), 74,000 O&M jobs (22,000 direct, 23,000 indirect, and 29,000 induced) would be lost at coal-fired power stations, compared with 124,000 O&M jobs lost (36,000 direct, 39,000 indirect, and 49,000 induced) when 17.8 GW is decommissioned. Not all job losses in Mpumalanga's fossil fuel sector can be compensated by clean energy jobs.³⁹ Further, the current jobs in the coal sector are overwhelmingly formal and permanent (95.3 percent), paying wages above those earned by similar workers in other industries thus indicating that the impacts on those directly affected are likely to be magnified by the transition.

42. The population in Mpumalanga, particularly communities living in concentrated coal areas, are also dependent on the coal sector for basic services including electricity, water and health services rather than their municipalities. This has led to the Mpumalanga provincial and municipal local economy to be reliant on the coal sector. For example, coal accounts for almost half of local revenues in eMalahleni and approximately a third in Steve Tswete and Msukalingwa. On its part, as towns have grown primarily due to in-migration triggered by job opportunities in the coal value chain, local governments have found it difficult to keep pace with providing basic needs for the growing population, especially those living in informal settlements, where many residents remain without access to electricity, water and sanitation or the means to pay for them.

43. In addition to the above, there are often invisible social impacts that result from increasing economic strains on households, among others, triggered by the phase out of the coal sector. Traditionally

³⁸ Quantec EasyData 2021

³⁹ https://www.cobenefits.info/wp-content/uploads/2022/01/COBENEFITS-Study_From-coal-to-renewables-in-Mpumalanga.pdf

marginalized and excluded groups often experience these more acutely. Frustrations that men may feel because of not being able to meet expectations associated with traditional gender norms around manhood (such as providing for a family) may result in high rates of crime and GBV. Women who are economically dependent on their partners are more likely to experience domestic violence. In addition to the psychological impacts and trauma that this may cause, the situation could also increase the spread of sexually transmitted infections, like HIV/AIDS among communities.

44. Studies conducted to better understand what works in just transitions in coal dependent communities, including on the Mpumalanga province, have found that insufficient community and civil society involvement and engagement would leave the just energy transition at significant risk of lacking support, legitimacy, and ultimately effectiveness.⁴⁰ Yet, progress in South Africa towards meaningful engagement with civil society and community stakeholders

1.4.3 A Community-Centered Approach and Mpumalanga's Policy Frameworks relating to Energy Transition

45. The Mpumalanga Vision 2030 aims to shift Mpumalanga's reliance on coal towards developing a green and sustainable economy while also prioritizing employment and economic growth, education, health and social protection for all. The Vision document sets out the need for a community centered approach as an essential condition towards building supportive, safe and cohesive communities in order to achieve the overall outcomes of the vision. The need for meaningful and long-term engagement with communities is also emphasized in the Mpumalanga Department of Economic Development and Tourism Strategic Development Plan 2020-2025 and in the PCC's Framework for A Just transition in South Africa, 2022.

46. Achieving these goals will require deliberate, comprehensive and effective planning; otherwise, there is a risk of the phase-out of coal leading to substantial socio-economic losses.⁴¹ Provincial and municipal level plans are also needed to ensure that the transition process meets the principles of a Just Transition, which include social inclusion, decent work for all, and poverty reduction. This will require development and implementation of a people-centered and a comprehensive strategy for economic growth that harnesses the potential in other sectors such as tourism and agriculture, following the coal phase out.

47. The transition from coal also provides for an opportunity to ensure gender-inclusive development in Mpumalanga, especially given the persistent gender gaps in the coal sector. Further, to ensure the 'justness' of the transition process, the strategy needs to focus on sustained bottom up approaches to participatory planning and decision making around the transition activities, from investments in social and economic infrastructure (including those relating to the green economy) to ensuring that all members of the target communities are provided with the information, facilitation, and capacity building to fully

⁴⁰ https://www.researchgate.net/publication/355900607_UNDERSTANDING_JUST_TRANSITIONS_IN_COAL-DEPENDENT_COMMUNITIES_Case_Studies_from_Mpumalanga_South_Africa_and_Jharkhand_India; https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/supporting_just_transitions_in_south_africa.pdf

⁴¹ https://www.cobenefits.info/wp-content/uploads/2022/01/COBENEFITS-Study_From-coal-to-renewables-in-Mpumalanga.pdf

participate in the benefits that the transition may bring.⁴²

48. There has been considerable preparatory work around what a green economy will look like in Mpumalanga including recognition of the importance of community engagement. However, less attention has been paid to specifically what community structures, systems, capacity and social support services, will be required and how communities can be engaged as partners and not simply beneficiaries of the transition process. This will in turn be essential to ensuring communities participate on equal footing with government and private sector counterparts in planning and decision processes in order to equitably benefit from the transition outcomes.

2 Accelerating Coal Transition (ACT) Context

2.1 State of Coal Mining and Coal-Dependent Energy Systems and Assets

2.1.1 Mining sector in the country's economy

49. South Africa is rich in mineral resources, ranging from coal, diamonds, gold, iron, nickel, silver, platinum and uranium. The mining sector plays a key role in the economy. According to the latest data from the Minerals Council⁴³, the South African mining sector contributed a 7.5 percent share to total GDP in real terms and more than 4 percent comes from the coal value chain. The direct contribution of mining to fixed investment was ZAR 95.7 billion in 2020 (USD 5.58 billion (at 17.15 ZAR = 1 USD as of July 1, 2022)). As a whole, mining contributes more than 20 percent to the economies of the provinces of Limpopo, Mpumalanga, Northwest, and the Northern Cape. While employment opportunities are the largest contributor to the provincial economies, the revenue from mining activities and employment also enables better infrastructure in these areas.

50. South Africa is currently the world's fifth largest producer of coal with 248 million tonnes in 2020 (which accounts for 94 percent of Africa's coal production) and is a major producer and exporter of coal and mining products with exports accounting for R45 billion (USD 2.62 billion) in 2020. South Africa's coal production peaked at 263 Mt in 2014 compared to 258.9 million tonnes in 2019 before seeing a decline in 2020 due to COVID 19. Coal provides 74% of South Africa's primary energy needs, and the country is also a large user and importer of natural gas, mainly for industry. Coal is also a source of natural gas production through coal bed methane, and of synthetic oil fuels.

51. The coal value chain has been central to South Africa's development for over a century, especially for energy, petrochemicals, and metals refineries. Coal is the main fuel for electricity generation, powering 87% of the country's total generation. Coal is the main input in basic chemicals and is a key input to the coal-to-liquid process (28% of fuel supply) as well as to metallurgical industries. Coal is also important for general uses including domestic heating and cooking. Recent trends in coal demand from key sectors include:

- a. **Power Generation:** There are 12 coal fired power plants located in the Mpumalanga province, two in the Limpopo province, one in the Free State (privately owned by Sasol), and three (including one privately owned plant – Kelvin Power Station) located in the

⁴² Socio-Economic Impact Study For The Shutdown And Repurposing Of Komati Power Station To Create A Basis For Sustainable Livelihood, Draft Integrated Report By Urban-Econ Development Economists June 2022

⁴³ <https://www.mineralscouncil.org.za/sa-mining/slps/slps-by-sector>

Gauteng province. The other privately owned power plant is located in Richards Bay, KwaZulu-Natal province and is a combined gas, biomass, and coal power plant. Eskom's sales of electricity (in GWh) have declined steadily in the past several years, partly as a result of external factors such as relatively slow national economic growth over the past five years, due to the closure of energy-intensive smelters and because many industrial customers responded to higher electricity tariffs by becoming more energy efficient.⁴⁴

- b. **Petrochemical industries:** Sasol is the largest coal-to-chemical producer in the country. Like Eskom, Sasol has seen a decline in chemical production in recent years due to sluggish economic growth in South Africa and as a result of supply chain disruptions following the COVID pandemic. As a result, Sasol plans to shift from coal to gas (imported from Mozambique) as part of its strategy to reduce its emissions intensity. This shift is likely to reduce its demand for coal over time.

52. Historically, coal exports accounted for 30% of coal production by volume but about 50% by value⁴⁵. Australian thermal coal futures that were trading at about \$80/tonne at the start of 2021 rocketed to a record high of \$440 a week after the conflict in Ukraine began and were trading at \$326/tonne in May 2022. Mining companies in South Africa have resorted to trucking coal to ports to meet a surge in European demand since the war in Ukraine started, bypassing the deteriorating rail infrastructure they blame for billions of dollars in lost revenue.

53. South Africa's coal industry provides both direct and indirect employment for as many as 250,000 people (ranging from power generation, liquid fuels manufacture, etc.). It is concentrated in Mpumalanga and Limpopo provinces that have higher-than-average unemployment levels, making the transition more challenging from a socio-economic perspective. Formal employment in the coal mining sector is about 94,000, which is 20 percent of employment in the overall mining sector in South Africa.

54. As part of the coal phase down, it would be necessary to address all aspects of the coal supply chain including the closure of mines. The GoSA places highest priority on the decarbonization of the power sector due to its significance in addressing climate change and therefore has requested the MDBs to focus this investment plan on addressing decarbonization of the power sector.

2.1.2 Gradual decline of the coal value chain

55. Coal suppliers are increasingly aware of the concentrated risks in South Africa, such as limited transport and other essential infrastructure such as health facilities, data centers, waste and wastewater, and emergency services. As a result, some coal suppliers, particularly larger international firms, have been diversifying their sales of coal in anticipation of the upcoming transition in the South African power sector. Larger mining companies, including Anglo American, Exxaro and Glencore, among others, are better placed to diversify their operations and to implement formal programs to support their employees to re-skill as needed. Groups like the BHP and Rio Tinto, have made recent announcements regarding their intention to diversify⁴⁶ in other ways, e.g., by investing in the platinum group of metals (PGMs) used in green hydrogen production and other climate-smart mining and metals production important for a

⁴⁴ <https://www.eskom.co.za/wp-content/uploads/2021/08/2021IntegratedReport.pdf>

⁴⁵ Burton, J. et al. (2018). Coal transition in South Africa - Understanding the implications of a 2°C-compatible coal phase-out for South Africa. IDDRI & Climate Strategies.

⁴⁶ <https://www.whitecase.com/publications/insight/mining-metals-2022-esg-and-energy-transition-sectors-biggest-opportunity>

climate-friendly future, as well as by investing in renewable energy generation. BHP and Glencore signed a nickel supply agreement and cobalt supply agreement, respectively, with Tesla. Both metals are used to manufacture rechargeable batteries. Meanwhile, Rio Tinto is partnering with customers such as Apple to produce carbon-free aluminum⁴⁷. These announcements come in the wake of a significant boom in global commodity prices combined with a sharp increase in investor interest in Environmental, Social, and Corporate Governance (ESG).

56. Notwithstanding the current coal export boom as a result of the Russia-Ukraine conflict, the main climate-change related impacts on the coal value chain derive from a decline in demand at home and abroad, as countries seek to reduce their GHG emissions especially from electricity generation and other uses.⁴⁸ The impacts as a result of GHG policy are, however, “difficult to distinguish in some cases from the effects of the slowdown in the South African and global economy⁴⁹.” Moreover, it is not possible to attribute the future anticipated closure of specific coal mines to the accelerated decommissioning of specific coal plants. More analysis and research are needed to pinpoint specific mines that are likely to be at risk of closure in the future.

57. Despite the current lack of specificity about which coal mines are most at risk of closure, in general, it is expected that 18 GW of coal power plants and associated mines will be shut down by 2035. The resulting decline in overall employment will provide an opportunity to support better planning to enable a more just transition. This is especially important given the historical track record of derelict and ownerless mines (mainly pre-1991), as well as of more recently “abandoned mines” that have been placed on interminable care and maintenance and are not formally recognized as closed by DMRE. These ownerless, derelict and abandoned mines have left behind a legacy of destroyed livelihoods with degraded land, acid mine drainage and air and water pollution that not only endangers community health, but also constrains investment in agriculture, tourism and other economic revitalization efforts.

58. Coal mining communities are expected to require support in planning and preparing how to respond to the various JET challenges over the next five-to-ten years. These challenges range from financing new technology and reducing the carbon footprint of their operations to reskilling of workers to engage in alternative economic activities. They also need to be prepared for proper mine closure, including preparing land, water and related assets for repurposing, while addressing the needs of employees and community stakeholders.

2.2 Coal Transition in the Power Sector

2.2.1 Decarbonizing the Electricity Sector as a Key to Meeting NDC Commitments

59. The power sector is the largest GHG emitter in South Africa (48%), followed by transport (10%) and agriculture (9%). Electricity generation in South Africa alone represents approximately 40% of Sub-Saharan Africa’s power sector GHG emissions. The country’s biggest power sector emission in the region is also partly attributed by electricity exports as well. The country is interconnected with its neighbouring

⁴⁷ <https://renewafrica.biz/news/south-africa-news/motsepes-arm-commit-to-a-renewable-energy-future/>

⁴⁸ TIPS: National Employment Vulnerability Assessment: Analysis of potential climate change related impacts and vulnerable groups, Oct 2019

⁴⁹ Ibid.

countries through the Southern African Power Pool (SAPP): Botswana, DR Congo, Namibia, Swaziland, Lesotho, Zimbabwe, Zambia, and Mozambique. The country is a net exporter, between 2 and 7 TWh per year over 2010-2019 period (4.4 TWh in 2020).⁵⁰

60. South Africa has identified decarbonization of its electricity sector as a central climate action priority, consistent with the country's coal transition roadmap and the emerging JET initiative. The decommissioning and repurposing of uneconomic CFPPs and replacing the retired coal-based generation capacity, along with enabling significant new investments in renewable energy within the timeframe until 2030-31 that are consistent with the country's IRP-19, are key elements of South Africa's ambitious international climate change commitments contained in its updated NDC commitment.

2.2.2 Status of Coal Power Generation

61. Coal-fired power generation present the highest share in Eskom's generation mix from 15 CFPPs with a combined capacity of 44GW. Eight of these plants are in and around Emalahleni in Mpumalanga province within a 35-mile radius of each other. The newest power plants each with an estimated life span of 50 years have a capacity of 4,800 MW, namely Medupi, where the first unit was recently commissioned in 2015 and Kusile, which is expected to be commissioned in 2025. Table 2 lists Eskom's coal-fired power generators. The difference between installed and nominal capacity reflects auxiliary power consumption and reduced capacity caused by the age of the plant.

⁵⁰ Enerdata, February 2022. Country Energy Report – South Africa.

Table 2 Eskom's coal-fired power generators

Name of station	Years commissioned, first to last unit	Total installed capacity (MW)	Total nominal capacity (MW)
Arnot	Sep 1971 to Aug 1975	2,220	2,100
Camden ¹	Mar 2005 to Jun 2008	1,561	1,481
Duvha ²	Aug 1980 to Feb 1984	3,000	2,875
Grootvlei ¹	Apr 2008 to Mar 2011	1,180	570
Hendrina ³	May 1970 to Dec 1976	1,760	1,135
Kendal ⁴	Oct 1988 to Dec 1992	4,116	3,840
Komati ¹	Mar 2009 to Oct 2013	990	114
Kriel	May 1976 to Mar 1979	3,000	2,850
Kusile ⁴	Aug 2017 to Mar 2021 (Under construction)	2,397	2,160
Lethabo	Dec 1985 to Dec 1990	3,708	3,558
Majuba ⁴	Apr 1996 to Apr 2001	4,110	3,843
Matimba ⁴	Dec 1987 to Oct 1991	3,990	3,690
Matla	Sep 1979 to Jul 1983	3,600	3,450
Medupi ⁴	Aug 2015 to Nov 2019 (Under construction)	3,970	3,597
Tutuka	Jun 1985 to Jun 1990	3,654	3,510
Total		43,256	38,773

1. Former mothballed power stations that have been returned to service. The original commissioning dates were:

- a. Camden was originally commissioned between August 1967 and September 1969
- b. Grootvlei was originally commissioned between June 1969 and November 1977
- c. Komati was originally commissioned between November 1961 and March 1966

2. Due to technical and/or financial constraints, some units at these stations have been derated.

3. The Duvha Unit 3 recovery project has been cancelled, and the unit removed from the installed base.

4. Certain units are under extended inoperability and their capacity has been removed from the nominal base.

5. Dry-cooled unit specifications based on design back-pressure and ambient air temperature.

(Source: Eskom, 31 March 2021. Integrated Report)

62. Eskom's coal plant fleet has an average age of 41 years and about 25 percent of the current generation capacity is coming to the end of its life in the next 10 years (IRP-19⁵¹). This old and cost-inefficient coal fleet has been poorly maintained over the last decade, causing a structural generation shortage that led to power shortages from 2007. In addition, the two newer power plants, Medupi and Kusile (at 4800 MW capacity each), have faced cost and time overruns and design defects. Medupi also had performance and safety issues.

63. Operating these old CFPPs longer or harder will exacerbate the already precarious Eskom's financial position given the inefficiency of the fleet and the non-compliance to environmental standards. Generation division's maintenance cost increased by 26 percent from ZAR 9.9 billion in 2020 to ZAR 12. Billion in 2021. Eskom can also be affected by the Carbon Tax Act (CTA 2019) which is to levy a carbon tax on GHG emissions. While Eskom is not expected to have a carbon tax liability until January 2023 due to the rebates allowed in the CTA, the liability is expected to be more than R11 billion per year after that.⁵²

⁵¹ DMRE, 2019. *Ibid.*

⁵² Eskom, 31 March 2021. Integrated Report

Eskom set up a 50-year CFPP decommissioning schedule, where approximately 10 percent of the coal generation capacity will be decommissioned by 2030 and more than 60 percent will be retired by 2045.

2.3 National Policies Enabling Coal Transition

64. Coal phase down efforts in South Africa are also enabled by the Climate Change Act and efforts in the area of Air Quality Management.

2.3.1 Climate Change Act⁵³

65. Following a lengthy, multi-year stakeholder process, the government (DFFE) introduced a Bill (BN 2022) with proposed language for a Climate Change Act to Parliament on February 18, 2022. The Act seeks to provide for a coordinated and integrated response by the economy and society to climate change and its impacts, including setting a strategic direction and process for adaptation and disaster management and creating a framework for the operation of the Commission on Climate Change.

2.3.2 Air Quality Management

66. Climate change mitigation and air quality management are mostly addressed separately in South African legal acts and policies.⁵⁴ In the years following South Africa's emergence from apartheid in 1994, several new laws were put into the books to protect all its citizens, including the National Environmental Management Act of 1998⁵⁵. Subsequently, the Air Quality Act of 2004 was signed by the President in 2005 and introduced Minimum Emission Standards (MES) for coal and liquid fuel generators⁵⁶. The MES regulations provide time frames for compliance to power plant air quality emission limits and provide for a once-off suspension of meeting these standards for newer plants and for older plants being decommissioned by 31 March 2030; and that the National Air Quality Officer may grant an alternate emission limit or emission load if certain conditions are met.

67. In June 2019, two environmental organizations, namely groundWork and Vukani Environmental Justice Movement in Action, supported by a coalition of other organizations and represented by their lawyers at the Center for Environmental Rights, filed a landmark lawsuit against the Government of South Africa for failing to crack down against power plants operated by Eskom and refineries owned by Sasol.

68. Pursuant to the MES guidelines, Eskom sought postponements for meeting some of the air quality compliance timelines for 16 of its power stations (Majuba, Kendal, Lethabo, Tutuka, Duvha, Matla, Kriel, Arnot, Hendrina, Camden, Komati, Kusile, Grootvlei, Matimba, Medupi, Acacia and Port Rex)⁵⁷. In its

⁵³https://www.parliament.gov.za/storage/app/media/Bills/2022/B9_2022_Climate_Change_Bill/B9_2022_Climate_Change_Bill.pdf

⁵⁴ A policy review of synergies and trade-offs in South African climate change mitigation and air pollution control strategies can be found at: <https://www.sciencedirect.com/science/article/pii/S1462901115301180#>

⁵⁵ https://www.gov.za/sites/default/files/gcis_document/201409/a107-98.pdf

⁵⁶ https://www.dffe.gov.za/sites/default/files/legislations/nema_amendment_act39.pdf

⁵⁷ Eskom's oldest coal fired power stations Camden, Hendrina, Arnot, Komati, Grootvlei, and Kriel are scheduled to shutdown by 2030 with Komati being the first to shut down its last unit in September 2022 and Hendrina before 2025. The two peaking stations, Acacia and Port Rex reach their 50-year life in 2026/7.

exemption application to the DFFE, Eskom stated that while it intended to improve ambient air quality for the health of affected communities, it faced significant challenges to meet the Particulate Matter (PM), Nitrogen oxides (NOx) and Sulphur Dioxide (SO₂) emission standards. Eskom estimated that the cost of full compliance with the MES is over ZAR 300 billion (US\$ 21.8 billion) for end-of-pipe control technologies, which would add at least 10% to the existing electricity tariff without adding any additional generation capacity to the grid. Eskom added that installing emission reduction technology would increase its water demand by an additional 20% in a country already facing water stress and reduce power available to the grid.

69. As an alternative to expensive retrofits on its ageing coal plant fleet, Eskom argued that its planned emission reduction plan included investing in technology retrofits to reduce emissions, the progressive closure of older stations, and the move to a cleaner energy mix. It stated that its forward-looking plan had a broader sustainable development perspective that would seek synergies between the important objectives of air quality, water conservation, waste reduction and climate action rather than simply investing money in retrofitting expensive end-of-pipe technology to reduce stack/point source emissions at ageing coal-fired plants with a limited remaining lifetime. Specifically, Eskom's plan would result in a reduction of emissions, including PM, SO₂ and NOx by 58%, 46% and 66%, respectively, by 2035 and of Carbon Dioxide emissions by 50% by 2035. Moreover, Eskom stated that its planned initiatives would result in a substantial reduction of emissions going forward in line with its Just Energy Transition (JET) strategy and the government's policy objectives in terms of greenhouse gas reduction.

2.4 Key stakeholders

2.4.1 Planning & Coordination Level

70. *The National Planning Commission (NPC):* South Africa's NPC is the highest national government structure charged with meeting South Africa's international commitments to reduce CO₂ emissions. The Commission is under the Office of the Presidency and its main objective is to rally the nation around a common set of objectives and priorities to drive development over the longer term. Led by the NPC, South Africa's Nationally Determined Contribution (NDC) was updated and ratified by Cabinet in 2021.

71. *The Presidential Climate Commission (PCC):* The PCC is a multi-stakeholder coordination body that was established with an advisory mandate by the NPC for the Just Transition Framework. It is chaired by the President of South Africa to help realize the government's international climate change commitments by advising on the country's climate change response and pathways to a low-carbon climate-resilient economy and society by 2050. The PCC has been conducting consultations with a wide variety of stakeholders across the country and emphasizes the "just" in Just Transition to include economic revitalization, job creation and community engagement in coal areas impacted by the transition and to protect the most vulnerable to climate change, in particular women, the youth and the marginalized. These consultations have influenced the design and scope of activities envisaged in this IP.

2.4.2 National Government Departments

72. The **National Treasury (NT)** seeks to protect the economy and unlock economic opportunities that will enhance the country's ability to adapt to the rapidly changing climate and to realize socio-economic benefits from the transition to a lower carbon, greener economy. NT has provided guarantees back-

stopping Eskom as off-taker of PPAs with private-sector project developers for the first five bidding windows of the REI4P as well as for the 2021 RMI4P process.

73. The **Department of Mineral Resources and Energy (DMRE)** is the consolidated line ministry responsible for policy, regulation and the promotion of development of the mining and energy sectors, which was created in 2018 through the merger of the former Department of Energy (DOE) and the Department of Mineral Resources (DMR). It is charged with planning for the provision of sustainable and affordable energy, including IRP-19, and of defining relevant policy to foster the Just Energy Transition (JET) in a manner that promotes economic growth and development, social equity and environmental sustainability. The National Energy Regulator of South Africa (NERSA) is the regulatory body since 2004, for electricity, petroleum products and natural gas. NERSA is an independent entity by law, but largely dependent on DMRE in practice, as all new regulations are drafted and approved by DMRE. NERSA has made consistent efforts to move towards cost reflective tariffs in the power sector. 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 fully 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 anticipated as a crucial element of the forecasts until FY 2026. However, the decline in power supply combined with tariff increases has been met by opposition and protests by many South Africans.

74. DMRE, which has expressed concerns about the price and security of electricity supply and the competitiveness of the mining sector, including the just transition of impacted workers and communities, recently gazetted several important sector reforms that should spur much needed investment for renewable energy investment by the private sector selling directly to buyers⁵⁸. This builds upon the record of accomplishment of the former DOE's IPP Office, which completed five previous bid windows of the REI4P auction where it selected preferred bidders for private investment in renewable and issued an RFP in April 2022 inviting proposals for bid window 6 to be evaluated starting in August 2022.

75. The **Department of Forestry, Fisheries & Environment (DFFE)** is the government department responsible for environmental protection, including mitigation of climate change impacts as well as negotiating and meeting international climate change commitments in alignment with the country's development objectives. DFFE sets national standards for air quality and provides leadership in environmental management, conservation, and protection. It has been actively engaged on Just Transition in several key value chains, including coal, PGMs, metals, petroleum-based transport, and tourism through its leadership on developing the National Employment Vulnerability Assessment and Sector Jobs Resilience Plans⁵⁹.

58 http://www.energy.gov.za/files/media_frame.html

59 The National Climate Change Response White Paper requires the development of Sector Jobs Resilience Plans (SJRPs). These plans aim to protect vulnerable groups that may lose their jobs or livelihoods as a result of climate change impacts, related either to physical effects or to the transition to alternatives. This report is the main report: National Employment Vulnerability Assessment - Analysis of potential climate-change related impacts and vulnerable groups

76. The **Department of Public Enterprises (DPE)** is Eskom's shareholder and is responsible for its oversight. It approves Eskom's strategic directions and investment decisions, appoints Eskom's senior management, and serves as Eskom's liaison with the national budget (NT) and policy (DMRE). DPE is the government department responsible for managing the transition of State-Owned Entities (such as Eskom and Transnet), including the development and implementation of alternative economic activities to economically sustain communities dependent on power stations and associated mines.

2.4.3 Provincial & Local Government Stakeholders

77. **The local governments of coal-dependent provinces:** The Mpumalanga provincial government has recognized that transition from coal is inevitable over time and has been proactive in exploring opportunities to stimulate investment in digital and green economy-led growth to smooth the transition by creating new jobs for local community members. Mpumalanga's Premier has announced plans to invest R10 billion (USD 730 million) to fight unemployment, which could help smooth this inevitable economic transition. These include a host of potential initiatives, including, for example, the opportunities presented by repurposing land on coal plants and mines that will ultimately be decommissioned. In collaboration with GreenCape, the region has prioritized a cluster development model by creating the Mpumalanga Green Cluster Agency, to build a modern green economy by bringing together government, business and academia to unlock new investment opportunities.

78. Municipal governments, especially where coal activities are concentrated, are not only reliant on the mines and power plants for their revenues but some of the municipal services, including electricity, water and health services, are also provided by the mines, Eskom or Sasol. As towns have grown due to urbanization and in-migration, local governments have not been able to meet the demands of their growing population, especially of those living in informal settlements.

79. **Municipal Electric Utilities (MEUs)** represent 60% of the power distributed to end-users. MEUs are administered by the municipalities and follow the national electricity regulations. Surpluses from distributing and marking up electricity procured from Eskom, which had been a major source of their revenues for many years, are now in decline. Real increases in bulk electricity tariffs from Eskom and municipal tariffs set by NERSA have severely compressed municipal distributors' gross margins in recent years, which declined from a combined 75% to 33% between 2007 and 2019. Nearly half the municipalities in the country are in financial distress and many MEUs suffer challenges related to service delivery failures, poor management, financial mismanagement, billing crises and power outages due to ageing and failing infrastructure, compounded by Eskom loadshedding.

2.4.4 Organized labour

80. The Congress of South African Trade Unions (COSATU) is concerned about the impact of unreliable and insufficient power generation on the economy and recognizes the need for urgent roll-out of new renewable and alternative energy in line with climate change challenges. NALEDI, the research arm of labour, has collaborated with the Trade and Industrial Policy Strategies (TIPS) research institution in support of JET related themes and a representative of each has participated in the ACT IP consultations,

<https://www.tips.org.za/research-archive/sustainable-growth/green-economy-2/item/3988-sector-jobs-resilience-plan-national-employment-vulnerability-assessment-analysis-of-potential-climate-change-related-impacts-and-vulnerable-groups>

where they have communicated the importance of employment creation and economic opportunity through the coal transition.

81. The National Union of Mineworkers (NUM) and the National Union of Metalworkers of SA (NUMSA) are active in the South Africa mining sector. Both unions have concerns about job losses and new job creation and NUMSA has expressed its hope that the transition away from a coal-based power to renewable energy and a green economy will create new opportunities for workers who will benefit from skills development for green jobs. They also support initiatives to promote local ownership, local content, and community benefits. Truck drivers and transport unions are a powerful voice in the country and have an interest in maintaining the coal value chain, including transportation of coal to local plants and to the Richard Bay terminal for export.

2.4.5 Civil Society Organizations & Academia

82. Trade and Industrial Policy Strategies (TIPS) and Project 90 by 2030 are among the CSOs that have produced substantive research and analysis on technical and socio-economic issues related to JET, which has informed national and regional discussions and dialog. The ACT team has also engaged with other organizations during the IP development process, including the Centre for Environmental Rights (CER) and NALEDI, among others. South Africa also has a well-developed university-based academic research community, including the University of Cape Town's (UCT) Energy System Research Group (ESRG), the University of the Witwatersrand as well as the Centre for Scientific & Industrial Research (CSIR) for applied R&D for scale-up and commercialization of new green economy technologies. Additionally, NGOs, mining action groups (e.g., Mining Affected Communities United in Action), women's organizations (e.g., Women of Change, Progressive Association of Women), local economic development forums, traditional leaders, youth groups (e.g., National Youth Development Agency), environmental groups (e.g., Earthlife Africa), etc., are also key stakeholders actively involved in South Africa's just transition agenda.

2.4.6 Private Sector and Industry Associations

83. The **Private Sector** actors in South Africa, including local developers and the financial sector, are credited with contributing to the success of the REI4P, which serves as a model for subsequent competitive power procurements in the country and on the continent. South Africa has a robust financial sector with experienced commercial banks that have proven their capacity to finance REI4P investments, *albeit with* loans to projects with Eskom PPA payment guarantees backed by National Treasury. As of December 2021, 6,323 MW of electricity has been contracted from 92 RE IPPs in Bid Windows 1-4 and 5,661 MW of electricity generation capacity from 85 IPP projects has been connected to the national grid⁶⁰, representing 9 percent of the total installed capacity⁶¹. Additional 2.6 GW of capacity is to be added by 25 IPPs through Bid Window 5 which launched in October 2021.

84. Many of the successful IPP bidder consortia were comprised of smaller South African companies that had partnered with large international firms on power generation, equipment manufacturing and energy services, overcoming initial skepticism from local businesses regarding the number of large international firms participating in the early auction rounds. The investment inflows and local content requirements attracted other segments of the value chain, including for local manufacturing of solar

⁶⁰ Independent Power Producer Office, 31 December 2021. *Independent Power Producers Procurement Programme (IPPPP): An Overview*.

⁶¹ The total net generation capacity is estimated to be 62,155.7 MW as of 2021 (Source: Fitch Solutions, 2022. *South Africa Power Report: Includes 10-year forecasts to 2031*).

panels and wind towers, balance of plant infrastructure including wind tower foundations, for the assembly and recycling of electrical equipment, and for wind and solar consulting services. Due to the discontinuous nature of the REI4P process, some of these local businesses that supported the value chain have since ceased operations.

85. SANEDI (South African National Energy Development Institute), the South African Wind Energy Association (SAWEA), The South African Photovoltaic Industry Association (SAPVIA) and the newly formed South African Energy Storage Association (SAESA) are important private sector partners.

2.4.7 Mining Council

86. The South African Minerals Council and its members are planning to pursue important investments in renewable power to securing energy supply for their operations. The council's members have indicated that they are planning to invest in about 2 GW of renewable energy at or adjacent to their sites. This "captive" or "embedded" power could be supplied directly by IPPs and will assist the members' mining operations and the national grid, while contributing towards the decarbonization of the South African economy over time.

2.5 Role of Private Sector, Innovation and Leverage of Resources

87. The recent enactment of the license exemption for generation of up to 100 MW combined with the worsening load shedding have triggered significant activity in the market with a number of large mining companies and industrials (Anglo American, Tronox, Sasol, etc.) looking to procure their own renewable energy projects under long term offtake agreements. Commercial banks have increasingly gotten comfortable with bilateral PPAs, particularly for creditworthy off-takers, and are providing very competitive financing terms similar to what is seen under the REI4P.

88. The private sector is also exploring the possibility of merchant power plants with no long term PPA albeit this is still at its nascency; optimal financing structure for such IPPs is yet to be determined. Further to this the wheeling framework is yet to be further fleshed out.

89. In terms of innovation there is considerable scope for taking the best proven ideas from abroad into consideration, e.g., on feed-in tariff design, Virtual Power Plants (VPP) community owned/cooperative generation plants.

2.6 Barriers to Just Transition Away from Coal

90. The Just Transition (JT) is one of the biggest challenges South Africa is facing in its efforts to secure the future and livelihoods of workers and communities in the transition to a low-carbon economy. The JT has been outlined in various national plans and roadmaps, such as the National Development Plan (NDP 2030) or the Fourth Industrial Revolution (2019), but is yet to be fully translated into an actionable implementation strategy. The existing policy and institutional framework on the JT remain fragmented with different stakeholders and policies developed at national, provincial and local levels. The graph below provides a broad overview of the current stakeholder landscape and policies / strategies developed at national, provincial level that relate to the JT.

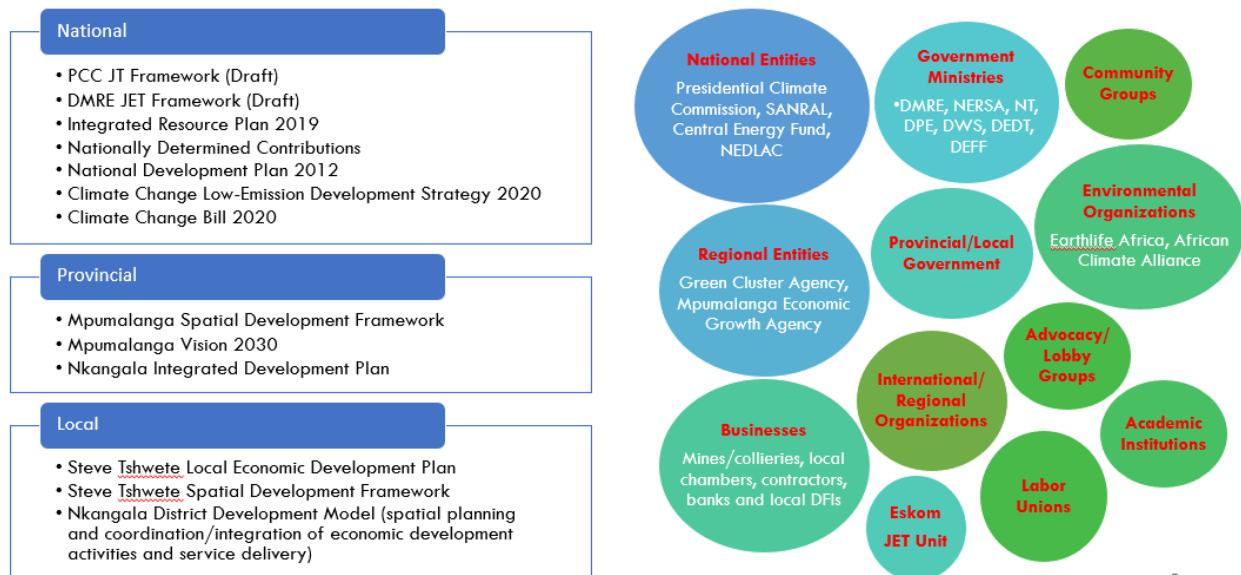


Figure 4 Policy and Institutional Landscape Supporting the Just Transition (JT)

91. To coordinate a nationwide JT, the Presidency mandated in 2020 the Presidential Climate Change Commission (or Presidential Climate Commission, PCC) to develop a Just Transition Framework for South Africa, setting out the actions that the government and its social partners will need to take to achieve a just transition, and the outcomes to be realized in the short, medium, and long term. The JT Framework is currently under preparation and being consulted and should be endorsed by the end of 2022.

92. Eskom’s financial health remains precarious even as its management introduces and implements measures intended to improve its position. Low profitability and an unsustainable debt burden 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. Debt arrears from municipalities have also been an increasing concern, impacting liquidity and even cash-based solvency indicators such as the cash interest coverage ratio, which dipped to an alarming level of 0.85 in 2021. In the context of Eskom’s financial situation and a deterioration in South Africa’s macro-economic indicators and sovereign credit rating, the National Treasury Department remains cautious about extending additional guarantees to the energy sector.

93. While retiring and repurposing ageing and inefficient coal plants and replacing the coal-based generation capacity clearly has clear long-term benefits, certain critical barriers must be addressed in the short term that are common to most plants. These barriers include costs and associated financing risks, the size of liabilities attached to plants, the complexity in identification of plants to be retired or repurposed, direct and indirect impacts on workers and communities dependent on the coal value chain, perceived or real supply security risks, and other system flexibility considerations⁶². The cost of retiring coal power plants, especially before the end of their lifetimes (including the costs of decommissioning, of environmental clean-up, and the loss of electricity production and revenues) and the investment needed to repurpose the plant to an income-generating asset (e.g., a renewable energy generation asset) may in some cases be too high to justify using purely commercial financing terms. An economic analysis of retiring

⁶² A detailed discussion on the topic is available in: D. Chattopadhyay et al, ‘Accelerating the coal transition’, *The Electricity Journal*, March 2021. <https://www.sciencedirect.com/science/article/pii/S1040619020301986>

and repurposing, and replacing coal-based generation capacity, on the other hand, considers the full range of costs from decommissioning costs and loss of revenue from the plant and social costs, and compares these with the benefits of closure that may include *inter alia* revenue from the repurposed site and avoided emissions costs.⁶³ Regulators can reduce closure costs by revising the tariffs for early recovery of the repurposing and capacity replacement investments made and compress the period of recovery, which would result in the tariffs increasing for existing customers. The impact of unaffordable higher tariffs as a result of accelerated transition from coal generation will need to be addressed by concessional climate financing in the early years of implementation.

94. Most concerningly, without adequate replacement capacity electricity supply will be affected nationally, particularly given the current condition of the coal power plants in South Africa, where recurrent load shedding is common even with the existing coal plant fleet. Coal plants are mostly old and cost-inefficient and have been poorly maintained over the last decade and caused a structural generation shortage. 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 on-grid power supply gap is between 4 and 6 GW and will not be filled prior to 2024. Therefore, the ongoing power shortfall in South Africa makes it politically and economically unattractive to shut down any generation, including coal plants, which supply power to the grid.

95. Building significant new affordable replacement generation capacity quickly and at scale is imperative to accelerate the decommissioning of coal plants. The South African commercial banking sector has developed a wealth of experience in financing onshore wind and solar through the previous rounds of the REI4P as well as dispatchable energy investments through hybrid projects in the RMI4P. However, financing battery storage and other commercially newer and more complex technologies, remains expensive and raises new risks. PPAs for the previous fifth round of the REI4P have been delayed, in part because of the rise in costs of renewable energy equipment since the close of the bidding process caused by increased global demand in the wake of the Ukraine crisis and supply chain disruptions.

96. In addition, the current inflationary and high interest financial context is not favorable for financing affordable new generation investments, especially at the scale required. As mentioned above, questions also remain about the continued appetite of National Treasury to provide guarantees backing PPAs with Eskom, especially with IPPs increasingly expected to shift to direct power contracting with commercial and industrial customers. The range of challenges to the timing and affordability of new renewable energy generation capacity create a potential roadblock to accelerating coal decommissioning in the context of existing power shortages in South Africa and raise the issue of how the country can use concessional financing to unlock these necessary investments in a timely and affordable manner.

97. From a regulatory perspective, while recent reforms introduced by the National Electricity Regulator of South Africa (NERSA) are intended to support captive generation and/or independent direct generation – which could help improve attractiveness of RE generation projects – there are still important regulatory gaps to be addressed. Under these reforms, a generator facility of up to 100 MW, including IPPs, would be able to sell electricity through a direct connection to a customer for their own use; or to multiple end use customers to whom the electricity is wheeled over a transmission or distribution grid without the need for a generation license from NERSA. The wheeling framework and charges that Eskom will apply will

⁶³ There is however a strong *economic* case for retiring and repurposing coal plants as discussed in: World Bank, Coal Plant Repurposing for Ageing Coal Fleets in Developing Countries, ESMAP, 2021. Available online: <https://openknowledge.worldbank.org/handle/10986/36238>

need to be clearly accessible and should be capable of being implemented without the need for lengthy one-on-one negotiations with Eskom. These technical and regulatory uncertainties that have not been addressed in the current regulations reduce the attractiveness of new RE projects providing replacement generation capacity. NERSA has been drafting a national framework for the use of system charges and there is no clarity yet on how wheeling and system charges will be applied. If wheeling is required, then the generation facility needs to meet the Grid Code requirements and have a connection agreement with the relevant grid provider(s) in order to be “registered” by NERSA, which has yet to release a current and simple registration procedure. This remains an additional barrier to much needed investment in generation capacity.

98. From a social perspective, the impact of accelerating coal transition on the upstream and downstream industries and activities linked to the coal value chain as well as the coal dependent communities need to be carefully considered in context of South Africa’s persistent and strong income inequalities, high unemployment rates and post-Covid economic recovery. The establishment of coal assets has generally been observed with the mushrooming of satellite towns and cities around the power plants and mines. Local economies, particularly in and around Mpumalanga, have developed and continue to be closely inter-woven with the full-scale coal operations. The economies of most of the coal-based areas are based on the revenues accruing from the mining fees, royalty, and local taxes apart from the additional boost to local enterprise and employment. Closure of coal-based operations in these areas would have a cascading effect on the upstream and downstream economic activities. Measures to reduce coal dependency and provide alternate economic opportunities for the local populace and small enterprises are critical, especially to avert the risk of the coal-dependent communities and towns turning into “ghost towns.” This makes a strong case for the use of concessional and grant funding to catalyze social and economic development in Mpumalanga.

99. The ongoing war in Ukraine has provided a temporary advantage to the South African coal industry as coal imports from South Africa to Europe have grown sharply. However, Europe has also made strong commitments to phase out the use of coal over time, so this temporary reprieve needs to be placed in the medium-term context where coal demand will decline in Europe and globally.

3 Program Description

3.1 Overview of proposed interventions

100. The discussion in the previous sections indicates that, although there are barriers to coal transition, (i) the plan should prioritize the electricity sector for the earliest impact in scale on GHG emission, (ii) coal fleets that are cost-inefficient and non-compliant to environmental standards need to be decommissioned, while not exacerbating the country's power shortage, (iii) the proposed intervention must include measures to mitigate the impact of CFPP retirement on the plant workers and ways to diversify the economy of the coal region given the country's high unemployment rate and economic disparity, and (iv) the impact mitigation and economic diversification activities should prioritize Mpumalanga province, where the most of the nation's coal reserves are focused and the three CPPs to be decommissioned are located. New generation installations can be considered in Mpumalanga and other coal regions. The investment plan design process considered these criteria in putting together the first transformative program for coal transition in South Africa.

101. Based on these factors, the ACT IP for South Africa consists of the following activities that will build the momentum for coal transition:

- a. Supporting the implementation of South Africa's CFPP decommissioning plan for three power stations at Camden, Hendrina, Grootvlei, and repurposing the plant sites and replacing the retired generation capacities by installing renewable energy and energy storage capacity on a PPP basis while considering the economic, social, and environmental challenges of transition, as informed by the Strategic Environmental and Social Assessment (SESA);
- b. Supporting community-driven development in coal-dependent Mpumalanga Province to support the transition process and invest in future green economy in relevant sectors, including on afforestation and smart agriculture; and
- c. Supporting the development of an Energy Efficiency in Public Buildings and Infrastructure Program (EEPPIP) for social and economic development, with an initial focus on the Mpumalanga Province.

102. The IP aims to strengthen the inclusion of women and their roles as employees, particularly in technical and leadership roles and in entrepreneurship while supporting those affected by the transition. The IP's gender and social inclusion approach will be adapted to each projects' specific design while taking into consideration addressing the specific barriers that women and other vulnerable groups experience in the energy sector and the transition process. Issues related to closing gender gaps in terms access to electricity, economic participation, voice and agency, as well as opportunities to promote gender equality and inclusion will be effectively identified and embedded throughout each project's cycle. Where relevant, participatory approaches will be adopted to ensure that the activities in the IP attend to the needs and priorities of women and other vulnerable groups. The IPs will include gender-specific indicators, disaggregated by sex and relevant vulnerable factors and analysis of quality, to monitor progress in terms of closing the gender gaps in relation to women's labor force participation, access to economic opportunities and increases in voice and agency.

3.1.1 Project 1: Retiring and Replacing Coal-based Power Generation Capacity

103. The project will utilize concessional finance including grant resources to jump-start process of decarbonization process of South Africa’s electricity sector by financing the implementation of three major components, namely (i) accelerating the dates of decommissioning up to three Eskom-owned coal-fired plants, namely Camden, Grootvlei and Hendrina, which are currently authorized by DEFF to operate until 2030; (ii) re-purposing the decommissioned CFPP sites and replacing the retired power generation capacity by mobilizing public and private investments in new renewable energy and auxiliary service infrastructure Mpumalanga and other coal-dependent regions; and (iii) providing transition support to coal plant employees as well as training opportunities for suppliers, contract workers and local communities, to be re-absorbed in new economic activities, including those created by repurposing and capacity replacement activities. Project activities will include specific measures to ensure that interventions to support job retention/transition support to workers, job creation especially in the clean energy sector, skills development, target women and other vulnerable groups. Further, these activities will also be informed by the targeted beneficiaries’ priorities and needs as identified through in-depth community engagement.

104. The decarbonization of the electricity sector and the concomitant retirement of coal-fired power plants is anticipated to present both positive environmental and social impacts as well as risks. Understanding these challenges, risks and opportunities will support upfront planning to make the transition just for workers and communities in coal-dependent areas. Accordingly, a Strategic Environmental and Social Assessment (SESA) will be prepared under this project to support strategic planning for implementation of Eskom's JET Strategy while effectively managing the environmental and social aspects of the transition process.

3.1.2 Project 2: Mpumalanga Community Development Project

105. The retirement of coal plants is expected to have significant impact on employment and income in Mpumalanga Province where 76% of South Africa’s total coal-related employment is concentrated.⁶⁴ As described above, many of the communities living in concentrated coal areas are dependent on the mines, Eskom, or Sasol for their jobs and livelihoods as well as essential public services, including electricity, water, and health services. Communities in these areas have social and generational ties that are closely linked to the coal sector which have persisted over time. Coal transition will also negatively affect the revenue of the local governments and their capacity to fund public services. This makes it imperative for the province and municipalities to plan for the coming transition, invest in future green economy jobs, and train the human capital needed for such jobs. The decommissioning process is also expected to weaken social cohesion unless a concerted bottom-up process to engage communities in the just energy transition process is prioritized.

106. The project objective is to support the provincial and local governments and communities in Mpumalanga province during the coal transition and to prepare for a green economy. The proposed project will entail three components: (i) community mobilization and capacity building to enable local communities to take part in decision-making process over local investments in social and economic infrastructure and income generating activities; (ii) strengthening governance mechanisms and institutional capacity to support the governance mechanisms and capacity development of provincial,

⁶⁴ In general, energy transition processes are known to have significant social impacts. Jason W. Beckfield, D. A. Evrard, Robert J. Sampson, and Mary C. Waters, “Social Impacts of Energy Transition” <https://ceep.mit.edu/wp-content/uploads/2021/09/The-Roosevelt-Project-WP-2.pdf>

municipal and local government authorities in Mpumalanga province to support the transition process in a sustainable and inclusive manner; and (iii) investments in community infrastructure schemes and income-generating opportunities in the green sector, including among others, through afforestation and smart agriculture initiatives.

107. The identification, design and implementation of these activities will be based on community needs identifications and assessment, regional and local government priorities, and will be carried out in consultation with local and provincial government, community organizations and local representatives, civil society groups, academia, and economic development agencies in the Mpumalanga region. Adopting the principles of community-driven development have been found to be successful both in the context of South Africa as well as in terms of the just transition processes elsewhere around the world.⁶⁵ Such an approach also aligns with the recommendations of climate change thought leaders on the utility of such a process in enabling South Africa to lead a just coal to clean transition, and eventually model for the world.⁶⁶ It is expected that the project will provide useful experience to test different approaches to scale additional JET interventions, including private sector investment while also ensuring the legitimacy as well as ‘justness’ of the transition process.

108. More details on Project 2 are available in Annex 5.

3.1.3 Project 3: Energy Efficiency, Distributed Generation and Community Generation Programs

109. At a national level the potential contribution of energy efficiency projects to the South Africa’s transition to a low carbon economy is recognised in the National Development Plan, the draft National Energy Efficiency Strategy and in the Climate Change Policy White Paper through its flagship projects. The Energy Efficiency and Energy Demand Side Management (EEDSM) flagship, aims to support the development and implementation of an aggressive programme of energy efficiency in industry, the residential sector and the government building sector.

110. The proposed project aims to develop a Mpumalanga focussed programme of the EEPBIP, to specifically drive the development and implementation of energy efficiency projects in the province. The project will not only reduce the use of grid-based electricity and their associated GHG emissions, but also contribute to social and economic development in the province. The expected outcomes are as follows.

111. Job creation in the energy services sector as a result of an increased pipeline of projects in Mpumalanga. With an increased long-term demand for services provided by energy services companies, they would be encouraged to set up a presence, with associated permanent jobs in Mpumalanga. In addition, the public sector pipeline this initiative will develop will provide a baseload of work that can leverage further private sector opportunities. The province has a number of energy intensive sectors (e.g., mining, paper and pulp, sugar milling) that are a potential source of such opportunities, in addition to a broad base of SMME activities. This diversification of the sources of projects would support the sustainability of these companies supporting long-term and localised employment benefits.

112. The development of an energy services sector would also create opportunities for new skills

⁶⁵ <https://www.3ieimpact.org/evidence-hub/publications/working-papers/community-driven-development-does-it-build-social-cohesion>

⁶⁶ Gompertz, D. (2022, January 13). Coal in 2022: South Africa’s Just Energy Transition Partnership. E3G. <https://www.e3g.org/news/coal-in-2022-south-africa-s-just-energy-transition-partnership/>

development for workers in Mpumalanga.

113. Retention of existing jobs is and will be important in Mpumalanga and this initiative should assist in supporting the resilience of existing companies. This is through the development of an active energy services sector in the Province which will be looking for opportunities to support companies in reducing their exposure to energy related costs. The SMME sector is particularly vulnerable to increasing energy prices in South Africa, whether it be liquid fuels or electricity related. Any reductions in these costs will assist companies to retain staff and lessen their impact on their growth strategies. In addition, reducing energy use further opens opportunities to address the energy security challenge South Africa businesses face, whether it be by storage and/or own generation. This reduced energy use reduces the scale, and therefore the costs, associated with such interventions.

114. In terms of speed this initiative is able to get up and running rapidly. It is building on an initiative that is already approved, in implementation and supported by DMRE, a key stakeholder in South Africa's Just Transition landscape.

115. Project concept briefs with more detail are available in Annex 5.

3.2 Enabling technologies and innovative models

116. There are examples, most notably in the UK and Europe, where coal plants have been shut down well ahead of the end of their economic life. Old coal plants are also being shut down in other parts of the world at a faster pace than ever. There are several alternative business models, or combinations of models, that countries could consider depending on their national context and the set of coal plants that they target. These include repurposing, auctions, policy-based closures, PPA swaps and others. The limited experience with the implementation of coal transition programs has been mixed. For example, the UK has seen success with its coal transition program, without necessarily adopting a specific business model at the national level. Australia's experience with the buyout model, however, was ultimately unsuccessful. Therefore, several factors need to be considered in choosing a suitable business model. In the context of the current structure of the power sector in South Africa and the urgent need to bring additional supplies, repurposing CFPPs and replacing coal-based generation capacities with Public Private Partnership (PPP) structures is considered a suitable option by the Government under this investment plan.

117. Repurposing CFPPs can be an attractive economic option in South African plants. Repurposing benefits can potentially outweigh decommissioning costs of older coal plants by a factor of five, addressing one of the key barriers to coal retirement⁶⁷. Given that technical decommissioning costs of coal plants in developed countries can be as high as US\$100–200/kW⁶⁸, coal plant repurposing can generate an alternative cash inflow that can absorb some of the decommissioning costs. This can be achieved by allowing some or all the existing components of the plant to continue to be in use. World Bank presents a comprehensive economic analysis framework to weigh the costs and benefits of coal plant repurposing. Using the example of a hypothetical coal plant in India, the paper shows that the benefits of the avoided

⁶⁷ Raimi, D. (2017). "Decommissioning US Power Plants". Resources for the Future. <https://media.rff.org/documents/RFF20Rpt20Decommissioning20Power20Plants.pdf>

⁶⁸ The World Bank estimates for such costs in South Africa and India, albeit for a limited number of plants as part of pre-feasibility studies, are well below \$100/kW

cost of carbon associated with early retirement and flexibility can far exceed the investments needed for repurposing.

118. One of the key benefits of repurposing is the reuse of the site of the coal plant, which already has transmission interconnection, and the replacement of some of the electricity or ancillary services being removed from the power system. In addition, repurposing could potentially provide employment opportunities for coal plant workers and allow energy systems to develop cheaper and cleaner energy sources. There are several different ways a coal plant can be repowered from its original use, and the costs and benefits of the repowering exercise differ based on the option selected. Identifying coal plants that would be suitable targets for retirement and repurposing requires: (i) a least-cost planning modeling and analysis to ascertain new capacity within the energy system that would meet future energy demand; and (ii) a cost-benefit analysis which compares the business-as-usual scenario with the repurposing scenario (Huang et al., 2021)⁶⁹.

119. Battery storage technologies are essential to speeding up the replacement of fossil fuels with renewable energy. Battery storage systems will play an increasingly pivotal role between green energy supplies and responding to electricity demands. Battery storage, or battery energy storage systems (BESS), are devices that enable energy from renewables, like solar and wind, to be stored and then released when customers need power most. Locating smaller, utility-scale battery storage closer to population centers can reduce reliance on long transmission lines. It can also decrease energy loss across transmission lines, also means that if one facility goes down, others are still able to operate. This strategy of developing decentralized generation has already been utilized in more developed economies.

120. A battery storage system can be charged by electricity generated from renewable energy, like wind and solar power (or any surplus power supply). Intelligent battery software uses algorithms to coordinate energy production and computerised control systems are used to decide when to keep the energy to provide reserves or release it to the grid. Energy is released from the battery storage system during times of peak demand, keeping costs down and electricity flowing.

3.3 Investment Preparation Activities

121. Some of the investment preparation activities have been ongoing led by the private sector or through upstream donor assistance. The World Bank, with assistance from the Energy Sector Management Assistance Program (ESMAP), has provided support to Eskom for undertaking technical as well as socio-economic and environmental assessments related to the Komati, Camden, Grootvlei and Hendrina power plants.

122. The IP also benefitted from the preparation activities related to the Komati project that included technical assessments, broad-based consultations with various stakeholders, and socio-economic impact assessment of the shutdown and the repurposing of the Komati Power Station for the power plant and the community. The Komati experience, in many ways, is a pilot for the ACT IP.

123. Policy briefs on Just Energy Transition and social assessments carried out by the civil society organization (CSOs) such as TIPS in the Mpumalanga province have been complementary and helpful in charting the course of investment in the province.

⁶⁹ Z. Huang et al, 'ACT on RE+FLEX: Accelerating Coal Transition Through Repurposing Coal Plants Into Renewable and Flexibility Centers', *IEEE Access*, 2021, Available online: <https://ieeexplore.ieee.org/document/9448134>

4 Financing Plan and Instruments

Table 3 presents a plan for financing the projects described in Section 3. It shows the proposed fund allocation from ACT as well as estimates of the amounts anticipated from MDBs, counterparts, the private sector and other development partners. As a part of USD 8.5 billion JETP, USD 500 million of ACT funding is expected to directly catalyze 5.3 times as much investment, most from private sector and public sector participations in public private partnership for repurposing of the decommissioned Eskom's coal power plants and replacing coal-based power generation capacities with renewable power generation.

124. Table 4 specifies the ACT financial instruments for each activity.

125. The breakdown of the USD 500 million ACT funding envelop by ACT program pillar will be USD 5 million for *Governance*, USD 270 million for *People* and USD 230 million for *infrastructure*.

Table 3 Summary of Financing Plan for South Africa by funding source

(US\$m)

Investment Plan Components	ACT				MDB			Country Counterparts	Private Sector	Others	Total
	Total	WB	IFC	AfDB	WB	IFC	AfDB				
Project 1: Retiring and Replacing Coal-based Power Generation Capacity											
Component A: Decommissioning	10	5	-	5	100	-	40	-	-	-	150
Component B: Repurposing and capacity replacement	230	70	68	92	375	70	165	300	860	-	2,000
Component C: Socioeconomic impact mitigation	110	110	-	-	90	-	-	-	-	-	200
Project 2: Mpumalanga Community Development Project											
Community Driven Development	100	95	-	5	5	-	5	-	15	30	155
Project 3: Energy Efficiency, Distributed Generation and Community Generation Programs											
EE and distributed generation	50	5	-	45	5	-	45	-	-	-	100
IP total	500	285	68	147	575	70	255	300	875	30	2,605

ACT = Accelerating Coal Transition, MDB = multilateral development bank, WB = The World Bank, IFC = International Finance Corporation, AfDB-pub = The public sector arm of African Development Bank, AfDB-pvt = The private sector arm of African Development Bank, EE = Energy efficiency, IP = Investment Plan.

Table 4 ACT Funding Allocation by Financial Instrument

(US\$ million)

Investment Plan Components	ACT IP Total			WB		IFC		AfDB	
	Loan	Grant	GU	Loan	Grant	Loan	Grant	Loan	Grant
Project 1: Retiring and Replacing Coal-based Power Generation Capacity									
Component A: Decommissioning	10	-	-	5	-	-	-	5	-
Component B: Repurposing and capacity replacement	225	5	-	70	-	63	5	92	-
Component C: Socioeconomic impact mitigation	95	15	-	95	15	-	-	-	-
Project 2: Mpumalanga Community Development Project									
Community Driven Development	75	25	-	75	20	-	-	-	5
Project 3: Energy Efficiency, Distributed Generation and Community Generation Programs									
EE and distributed generation	45	5	-	5	-	-	-	40	5
Total	450	50	-	250	35	63	5	137	10

ACT = Accelerating Coal Transition, MDB = multilateral development bank, WB = The World Bank, IFC = International Finance Corporation, AfDB-pub = The public sector arm of African Development Bank, AfDB-pvt = The private sector arm of African Development Bank, GU = Guarantee, EE = Energy efficiency, IP = Investment Plan.

126. The costs, financing instruments and funding sources of each project in the IP are based on the best estimation as possible at the time of the IP development. The USD 350 million ACT funding and USD 2.3 billion co-financing are allocated to the first project to cover the costs of decommissioning of the three identified CPPs to be decommissioned and another potentially. The cost estimates are informed by a comprehensive set of studies commissioned by the World Bank for the decommissioning and repurposing of the four Eskom-owned coal-fired power plants with earliest dates of planned shutdown and based on a conservative assumption on the inflation. The studies have been jointly supervised by Eskom and the World Bank and have been implemented since June 2021.

127. The ACT financing instrument for Project 1 will be a mixture of USD 20 million ACT grant and USD 330 million ACT concessional loan⁷⁰ channeled through the World Bank Group and AfDB. Component B *Repurposing and capacity replacement* is planned to be financed through PPP structure, mobilizing USD 860 million of private investments. Notwithstanding its current limits in PPP business models, Eskom plans to conduct a study funded by ESMAP on the use of private sector financing or PPP financing for the delivery of repurposing for the retired CPPs with the World Bank support.

128. The second project, *Mpumalanga Community Development Project*, will be funded by USD 75 million ACT concessional loan and USD 25 million ACT grant and further co-financed by bilateral development partners and philanthropies and moderate amounts of IBRD and AfDB loans and private sector investments. Given the requirement for a higher concessionality for this project, fundings from other development partners and philanthropic community will be actively sought during the investment project development stage.

129. CTF ACT financing will help to overcome first-mover costs, build confidence among local stakeholders and communities and accelerate the participation of private developers as well as commercial lenders along the process. The concessional terms of ACT financing are particularly crucial given Eskom's precarious financial health and current inflationary and high interest financial context. CTF Grants and risk financing will also provide the necessary flexibility to support social and economic transition of Mpumalanga where many people live on the margins already.

130. For Project 1, the affordability of energy is also an important consideration in the political economy of accelerating decarbonization. Although the cost of coal power generation is increasing, there may be still a price differential in terms of the cost of generation and the resulting tariff, depending on availability of the solar and wind resources in target regions. In order to attract new investment, the IP will allocate support in order to buy-down the cost of new dispatchable generation capacity from RE and battery storage in Mpumalanga in order to make it cost-competitive with the most recent comparable auction through REI4P or RMI4P. The ACT project design will explore ways to minimize the need to introduce a fiscal implication for RE deployment in the long-term.

⁷⁰ The CIF lending rates for South Africa is 75% of IDA-only regular service charge for 20-year-maturity loan and 90% for 30-year-maturity loan. The resulting pricing of CIF loans are 98 basis point and 117 basis point respectively, effective on or after July 1, 2022 (https://www.climateinvestmentfunds.org/sites/cif_enc/files/meeting-documents/joint_ctf_scf_cif_financial_terms_and_conditions_policy.pdf).

5 Additional Development Activities

5.1 Activities funded by other development partners

131. There are three major initiatives by the international donor community to support South Africa's energy transition, including a) the Eskom Just Energy Transition Project (JETP, the Komati project); b) the Climate Investment Funds (CIF) Accelerating Coal Transition (ACT) Investment Plan (IP); and c) the Just Energy Transition Partnership (JETP). While at different stages of development, these initiatives are all interrelated creating synergies. In August 2021, the Government expressed interest in the US\$1.5 billion concessional financing initial allocation provided by G7 countries through CIF. From the CIF ACT deliberations on October 13, 2021, South Africa was ranked first among all 13 countries that expressed interest. It was determined that South Africa would receive an allocation between US\$ 250 to 500 million, upon submission of the country's coal transition investment plan. These funds would need to be blended with multi-lateral bank funding (i.e., WBG and AfDB) to implement projects and programs. The World Bank continues to lead the developing of the IP with the South African Government, closely coordinating with IFC and AfDB.

132. The Just Energy Transition Partnership (JETP) was established by the Government of South Africa with the contributions from France, Germany, UK, the United States and the European Union (forming the International Partners Group, or IPG). The Partnership offered to mobilize US\$8.5 billion (R131 billion) over the next 3-5 years to support South Africa's Just Transition plans. A task team was subsequently appointed by South Africa President to work with the IPG on a comprehensive JETP investment plan (IP), aiming to channel the committed resource into an integrated investment programme. The Government has indicated that Partnership support should initially focus on three key areas (power sector transition, green hydrogen development and electric vehicles industrialisation and uses), with a special emphasis to accompany the socio-economic aspects of the programme. An Inter-Ministerial Committee chaired by President Ramaphosa is coordinating work on the country's Just Transition plan and on the financial offers made to South Africa in the context of the Partnership. The ACT IP and JETP IP are being prepared in coordination, facilitated by the Government.

133. The working draft of the JETP IP has been designed to enable a set of development outcomes that tackle poverty, inequality and unemployment, through the following: (i) develop new green industrialization opportunities; (ii) protect vulnerable communities in geographies and sectors most affected; (iii) increase employment, skills and livelihoods; (iv) locate investment within the broader country planning processes; (v) identify early and catalytic investments, indicative costs and timescales for energy transition; (vi) identify financing to support workers and communities; (vii) identify the potential for private sector investments and partnerships; and (viii) confirm the needed enabling policy and regulatory framework.

134. Donor financing from Norway, the US and the UK will also be coordinated with the local private sector. Norfund, the Norwegian development finance institution, and the UK's CDC Group have partnered to invest over US \$37 million (ZAR 600 million) in the South African private sector renewable energy company H1 Capital. The funding is expected to enable H1 Capital to fund a pipeline of over 2.4 GW of new wind and solar projects, generating approximately 6,400 GWh per year. The United States Agency for International Development's (USAID) Power Africa initiative will also support ESKOM with technical assistance funding for procurement of IPPs through the USAID Southern African Energy Programme.

135. One of the components under EJETP includes creating opportunities for workers and communities to enhance the opportunities from the positive impacts of the coal transition while minimizing the social and economic risks and impacts associated with decommissioning and repurposing of coal power plants. A private sector organization will be competitively selected to establish and manage the activities under the component which will include: (i) transition support to Komati workers; (ii) community development and economic diversification that will involve piloting/scaling-up of innovative initiatives in the energy sector (e.g., commercial agrivoltaics plant, containerized microgrid assembly and manufacturing facility), investments in local development activities, strengthening the livelihoods of affected communities through support to SMMEs, seed grants, incubation services, business development support, reskilling/upskilling community members in alternative development opportunities following the transition from coal, community support programs (e.g., early childhood development centers, mobile health clinics, etc); and (iii) stakeholder engagement and community empowerment. Training activities will involve partnership with NGOs and institutes such as the South African Renewable Energy Technology Centre (SARETEC), industry associations such as the South African Photovoltaic Industry Association (SAPVIA) or South African Wind Energy Association (SAWEA), Technical Vocational and Education and Training (TVET) colleges in the Mpumalanga region while the other activities will be carried out in partnership and collaboration with the private sector and provincial and local government.

5.2 Complementary work by other development partners

136. A number of major donors including Denmark, France, Germany, and the UK are active in supporting South Africa's Just Energy Transition.

137. The Danish Ministry of Climate, Energy and Buildings is supporting a programme with the Department of Energy on the provision of Danish TA for the South African energy transition. The Danish - South African cooperation has a special focus on wind energy mapping and energy efficiency. Funding of DKK 1,2 billion (approximately ZAR 1,9 billion) is provided from Denmark's climate fast-start' fund focused on three main areas – i) TA to the Department of Energy for scaling up renewables and energy efficiency, ii) mapping of South African Wind resources in Eastern Cape, KwaZulu-Natal and Free State provinces, and technical assistance to ESKOM focused on grid integration of renewables.

138. AfD has over US \$83 million in grants and US \$66 million in loans to Just Energy Transition Project activities in South Africa. The loans funds are focused on developing JET investment plans for ESKOM for identified coal plants totaling 75MW. AfD grants are focused on policy reforms for coal transition, green hydrogen market development, and renewable energy capacity additions.

139. Technical advisory and socio-economic support grants totaling over US\$70 million has been provided by GIZ for a variety of coal transition activities in South Africa. ESKOM and DMRE are recipients of TA grants focused on power sector reform and energy management systems as part of the Just Energy Transition program in South Africa. The Department of Higher Education and Training will receive a US\$11.5 million grant to support re-skilling and re-training of coal mine sector workers in preparation of coal transition. There is also an ongoing GIZ grant focused on developing a hydrogen market as part of the planned coal repurposing activities, led by DTIC. KfW also committed US \$220 million in loans to IDC for green hydrogen development. Over US \$735 million in KfW loans to ESKOM have been approved for TA studies needed for coal transition planning and grid integration of renewables, in addition to the already

committed US \$330 budget support loan to the National Treasury focused on energy sector reform for Just Transition as part of KfW's COVID Support Program in South Africa. KfW is also supporting at the municipal level through a planned US \$165 million loan to the City of Cape Town focused on scaling up renewables, a US \$110 million loan to the City of Johannesburg to improve EE and reduce GHGs in the waste sector and a US \$220 million loan to Transnet for electric locomotives manufacturing in the City of Durban. The eThekweni Metropolitan Municipality also received a US \$110 loan from KfW focused on climate-smart urban transport.

140. The United Kingdom's Partnering for Accelerated Climate Transitions (PACT) is a £11.6bn flagship program governed and funded by the Foreign, Commonwealth and Development Office (FCDO) and the Department for Business, Energy and Industrial Strategy (BEIS) under the UK's International Climate Finance (ICF) portfolio. The global program, which runs for five years to March 2026, supports action in South Africa on just transition pathways and a low-carbon economic recovery through climate action that contributes to job creation and poverty alleviation. Priority areas of focus for UK PACT in South Africa are aligned with key national priorities in the just energy transition, renewable energy, energy efficiency, sustainable transport, and sustainable finance. UK PACT projects can contribute to addressing industry-wide constraints, common metropolitan challenges, and bringing city, provincial and national level public and private partners together to address climate priorities.

6 Implementation Potential with Risk Assessment

141. In 2020, South Africa's economy contracted by 6.4 percent following the effects of the COVID19 pandemic, with broad-based effects across sectors. The toll on jobs was severe and has been persistent over the last two years, despite the rebound in activity in 2021. In the context of improving terms of trade, current account surpluses, and robust mining activity, the 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. However, 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 with rising concerns about net portfolio outflows as a result of the U.S. Federal Reserve raising rates and indicating further increases in 2022.

142. Many national government departments have stakes in the JET as do a wide number of other stakeholders. While this is excellent, the flip side of the coin is that decisions need to be made in an efficient manner for timely implementation. This makes it important to identify no more than a handful of implementation partners to manage the implementation process, while remaining accountable for results. This risk is mitigated by working largely with Eskom for public sector implementation, with a provincial economic development agency such as the Mpumalanga Green Cluster Agency for much of the community-based development activities and with the private sector to expand investment in renewable energy generation.

143. Institutionally, the power sector in South Africa is currently under structural reform. The unbundling of Eskom and the transfer of Eskom Transmission division to a wholly-owned subsidiary – is aimed to be finalized in 2022, but risks remain that the transition will not be completed on time. Eskom's financial situation also remains precarious. Without dealing with legacy debt, Eskom will remain unable to

pay its debt obligations without sovereign support. Financial risks for Eskom include low profitability mainly driven by Tariffs below cost-reflective levels, poor solvency and liquidity indicators including DSCR of 0.3 in 2021 and high level of indebtedness. The continued ability of National Treasury to backstop Eskom's PPAs with IPPs is also a risk to financing new replacement renewable energy capacity. Without new replacement capacity coming into place quickly, Eskom's planned schedule for retirement of coal plants is at risk.

144. In terms of renewable energy generation development potential, land is abundant, and South Africa has a relatively thriving private sector and liquid domestic capital market compared to the rest of the region, that could quickly scale up renewables if there is improvement in the enabling environment. Yet recent changes in the political landscape in South Africa render new generation investments riskier. Political and financial risk factors, including rising costs of borrowing, also reduce the likelihood of construction of new generation investments (including new fossil fuel plants) when planned retirements of existing plants come into effect in the short run.

145. Coal transition will undoubtedly require the provincial economy and communities to find new sources of sustainable livelihoods and income. This makes the success of the ACT program tied closely to the ability of existing employees and contractors to be absorbed into alternative opportunities and for new opportunities to be created for the community at large, especially by targeting women, unemployed youth, retired coal workers, people with disabilities, and other vulnerable groups.

146. Each coal plant retirement may also have risk impacts on the mines that deliver coal to the plants. All affected mines are owned by private sector companies who have coal supply contracts with Eskom. The duration of some of those coal contracts will go beyond the retirement schedule of specific plants. While these coal contracts are plant specific, Eskom has confirmed that it has a coal supply shortage and will be able to honor all its supply contracts and redirect those contractual volumes to other plants in its coal fleet.

147. With respect to specific coal plant decommissioning activities, the most severe environmental risks and impacts anticipated in South Africa include: (i) generation of large quantities of both inert and hazardous wastes, including exposure and release of hazardous substances such as asbestos, mineral fibers and mercury during the demolition activities; (ii) soil and ground water pollution, including potential legacy contamination concerns associated with contaminated soils and water resources, of which the full extent is currently not known; (iii) excessive noise, dust and vibration emissions; and (iv) community and occupational health and safety risks, especially through increase in road traffic, fall from heights, exposure to potentially hazardous substances, and exposure and spread of COVID-19 and other communicable diseases. Most activities are expected to be short in duration, predictable and manageable, and therefore of moderate to substantial environmental risk depending on the final repurposing and capacity replacement technology that will be selected for specific project sites under investigation. The main anticipated environmental impacts associated with each of the technologies include among others (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 and flickering (wind turbines); (iv) accidental fires and explosions (battery storage); (v) visual impacts due to potential glare reflection from solar PV panels.

148. Anticipated social risks for project activities are related to the adverse impacts of energy transition, such as: (i) direct impacts on employment and livelihood systems of those dependent on the coal value chain (e.g., women engaged in providing ancillary services); (ii) displacement and out-migration of workers

and communities; (iii) impact on social identities of coal-dependent communities and heightened vulnerabilities of excluded groups, including women, historically disadvantaged groups, migrant workers, and youth; (iv) exclusion of women, local communities and disadvantaged groups from decision-making, including those that are directly impacted from the closure of the power station; (v) decrease in land value, business growth/opportunities, and increase in informal settlements; and (vi) risks associated with temporary labor influx, labor and working conditions. These risks are particularly likely as a result of decommissioning of plants, especially if no alternate economic activities and jobs are created.

149. Decommissioning, repurposing, and capacity replacement activities are also expected to engage direct and contracted workers as well as primary supply workers. Accordingly, risks associated with temporary labor influx, labor and working conditions, occupational health, and safety, as well as Gender Based Violence (GBV)/Sexual Exploitation and Abuse (SEA)/ Sexual Harassment (SH), are present. Accordingly, a GBV/SEA/SH plan to prevent and mitigate the risks and also respond to those that arise, will also be required. Further, in relation to forced labor risks for solar PV panels, as some repurposing and capacity replacement projects might involve procurement of solar PV and batteries, prior to the commence of the procurement process, Eskom will undertake market analysis to identify the possible sellers of solar panels to the project. Bidding documents will emphasize forced labor risks in solar panels and components and will require that sellers of solar panels to the project will not engage or employ any forced labor among their work force.

150. The existing information around coal plant sites in South Africa does not indicate the presence of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities that would meet the criteria under the World Bank's Environmental and Social Standard on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities (ESS 7), but this will also be determined through detailed Environmental and Social Impact Assessments of each site. Open and transparent engagement with project stakeholders will be done on an ongoing basis to improve environmental and social outcomes, enhance project acceptance, and ensure successful project design and implementation. Project activities will also ensure that the stakeholder engagement process take into consideration current COVID-19 pandemic conditions in the country by outlining specific measures that will be taken to safeguard exposure and spread of COVID-19 in line with both the National and World Bank guidance on citizen engagement and stakeholder consultation during COVID-19.

7 Monitoring and Evaluation Framework

151. A monitoring and evaluation (M&E) framework will be established by the Government and national implementing entities, in cooperation with the MDBs, for the purpose of tracking and reporting on progress in achieving ACT objectives and outcomes, mirroring the results chain of the IP activities as presented in **Error! Reference source not found.** If ACT addresses funding gaps related to the successful implementation of the IP activities, then national governments, Eskom and private sector stakeholders will act to accelerate the retirement of existing coal power plants and their replacement with new sources of renewable energy while ensuring a holistic, integrated, socially inclusive and gender equal just transition away from coal. The M&E framework will be coordinated by the DFFE, the national ACT focal point.

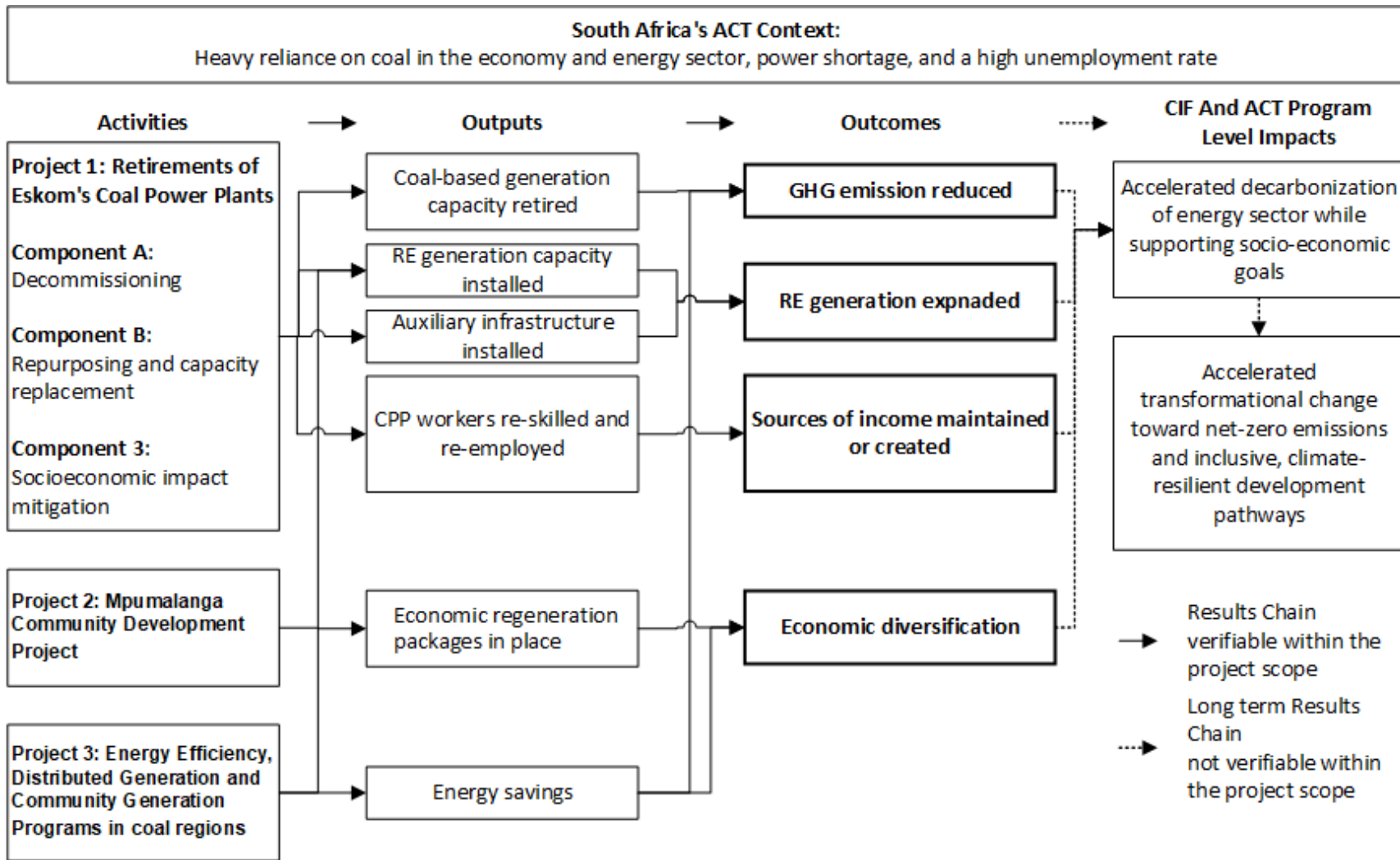


Figure 5 South Africa's ACT Results Chain

152. Table 5 summarizes the proposed M&E framework for South Africa’s ACT IP. The main results areas are decarbonization of power sector, mitigation of negative impact on the coal power plant employees and economic diversification of Mpumalanga region with an emphasis on gender equality. The respective indicators are placed at multiple levels on the results chain. Some of the results targets will be set up at the project development stages.

Table 5 South Africa’s ACT Integrated Results Framework

ACT Program Results Statement ¹	Indicators	Baseline	Targets
CIF-LEVEL IMPACTS			
Accelerated transformational change toward net-zero emissions and inclusive, climate-resilient development pathways	GHG emissions reduced or avoided (t CO2 eq)	0	- Approximately 71 million tons from decommissioning of CFPPs over the lifetime - 153,700 tons/year from EE activities
	Number of beneficiaries of ACT investments (disaggregated by gender, age, employment status, and other vulnerability status)	0	TBD
	Volume of co-finance leveraged (USD)	0	TBD
ACT PROGRAM-LEVEL IMPACTS			
Accelerated transition away from coal powered to clean energy while ensuring a holistic, integrated, socially inclusive and gender equal just transition	Share of renewable energy generation in South Africa’s power system (%)	7% ²	TBD
	Share of women participating in decision-making forums/platforms related to just transition	0	TBD
ACT PROGRAM-LEVEL OUTCOMES			
Sources of income created for affected employees through job retention or job creation	Number and percentage of employees of retired coal plants that have access to sustained income (#,%) (sex-disaggregated)	0	TBD
	Number of direct beneficiaries of income-generating schemes and economic regeneration activities linked to the green economy (#, \$) (sex-disaggregated)	0	TBD
Affected communities equipped with relevant skills for jobs of the future	Number of people trained in the renewable energy sector, medium- and high-skilled green jobs, STEM-education and relevant vocational training through ACT (sex-disaggregated)	0	TBD

ACT Program Results Statement ¹	Indicators	Baseline	Targets
	Number of new jobs created in clean energy sector (beneficiaries of new jobs disaggregated by gender, age, and other relevant vulnerable factors, with break down on long-term vs short term, formal vs informal, administrative vs. technical and managerial)	0	TBD
Transition to cleaner energy sources	Capacity of existing coal power generation assets accelerated for retirement (MW)	0	2,400 MW
	Installed capacity of renewable energy for repowering (MW)	0	900 MW
	Energy rating (MWh) and power rating (MW) of installed energy storage system to support the use of clean energy as a CFPP repurposing and capacity replacement solution	0	450 MW 1,800 MWh
Other infrastructure	Annual energy savings (GWh/yr)	0	145 GWh/yr
ACT PROGRAM-LEVEL CO-BENEFITS			
Social, Economic, and Environmental Development Co-Benefits	Air-pollutants emission reduced (ton)	0	TBD

3. Results Statement and the set of results indicators are guided by ACT Program Integrated Results Framework approved by CIF Clean Technology Fund (CTF) Trust Fund Committee

4. Source: Enerdata, February 2022. Country Energy Report – South Africa.

153. The methodologies for estimating expected GHG emission reductions from Project 1 and Project 3 will be developed at each project development stage in alignment with the applicable international standards. For Project 1, GHG emission reductions attributable to the accelerated decommissioning of the three CFPPs will be estimated by simulating the entire power system, as guided by CIF ACT Integrated Results Framework, using factual and counterfactual scenarios. The expected GHG emission reduction will be estimated by comparing the emissions under both scenarios. The factual scenario is under which the CFPPs will be decommissioned as scheduled by Eskom. This scenario's emissions result from a combination of available marginal generation technologies that are likely to replace the power generation outputs that would have been produced by the project CFPPs. The emissions of the counterfactual scenario result from the extended operation of the CFPPs in question. The most likely life extension options and durations will be carefully assessed through discussions with Eskom.

154. Transformational change⁷¹ will be tracked in accordance with CIF monitoring, evaluation, and learning approach using ACT integrated results framework as a guiding tool. Monitoring data from various levels on the results chain will feed into the evidence base for Transformational Signals⁷² to measure the

⁷¹ Transformational change is defined as “fundamental change in systems relevant to climate action with large-scale positive impacts that shift and accelerate the trajectory of progress towards climate neutral, inclusive, resilient, and sustainable development pathways (Transformational Change Concepts, May 2021, https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/tclp_workshop_updated_tc_concepts_may2021.pdf).

⁷² Transformational Signals – which can be advanced or emerging – offer an alternative conceptual framework for recognizing and capturing transformational change through the programmatic lifecycle

transformational impact of ACT intervention. Stand-alone evaluation and learning activities may be carried out against the five dimensions of transformation change, relevance, systemic change, scale, speed, and adaptive sustainability, driven by CIF AU or initiated by the country or the participating MDBs.

South Africa's ACT integrated results framework will be implemented in collaboration between various stakeholders. The national focal point or implementing entities have a crucial role in adapting the integrated results framework to their own context and needs, collecting the results data, and remaining accountable. The MDBs are primary agents of results management at investment project level. They are responsible for ensuring the incorporation of all core indicators and at least one co-benefit indicator into project-level results frameworks, establishing their targets, and reporting updates of achieved values to CIF during the annual reporting period. Within the CIF Administrative Unit, the monitoring and reporting team is primarily responsible for the design, implementation, and oversight of CIF's monitoring approach, including the annual reporting process for each CIF program, results data management, and analysis. CIF's gender team is an available resource for technical support on integrating gender equality and social inclusion issues into future ACT projects. They are responsible for monitoring progress on CIF's Gender Action Plans and co-managing gender-related evaluation.

Annex 1. Responsiveness to ACT Investment Criteria

ACT Criteria	South Africa Investment Plan Relevance
1. Potential for Transformational Change	
Relevance	Transformational change of this investment plan is expected for coal transition from the decommissioning and repurposing of three coal power plants at Camden, Hendrina, Grootvlei and replacing coal-based generation capacities, including installations of renewable energy and energy storage capacity, while considering the economic, social, and environmental challenges of transition.
Systemic Change	The investment plan will bring about systemic benefits in terms of reduced coal transport costs and environmental costs, as well as and avoided electricity transmission losses with distributed solar generation. Businesses and community services to benefit from improved reliability of electricity and reduced pollution as a result of coal decommissioning. In terms of specific electricity sector benefits, the investment plan will promote an open electricity market and more investment in the electricity value chain as renewable energy generation installations increase.
Speed	Given the commitment from key public sector stakeholders in South Africa, the initiatives planned in this IP will be able to get up and running rapidly within 6 months to initiate implementation. The IP is building on government and Eskom plans that have already been approved, in implementation and supported by DMRE, a key stakeholder in South Africa's Just Transition landscape. The activities planned for immediate implementation include undertaking energy audits; identifying and developing business plans for potential energy efficiency projects; developing standardised procurement and energy performance contracting procedures; and, associated capacity-building activities in the public and private (including financial) sectors.
Scale	The share of renewable energy generation in South Africa's power system is expected to increase from the current baseline of 6% to over 10% of the country's power grid. Capacity of existing coal power generation assets accelerated for retirement is expected to be over 2 GW, while the expected installed capacity of renewable energy from repurposing and capacity replacement is expected to be over 900 MW.
Adaptive Sustainability	South Africa has adopted a national climate change response policy that also includes several adaptation plans, mainstreamed across sectors and different government tiers, with strong institutional framework for coordination, monitoring and reporting. The renewable energy installations and reduced pollution expected from this IP will enhance adaptation and resilience, making it easier for physical or natural systems to cope with climate change. There has also been a commitment from South Africa's National Treasury (NT) to protect the economy and unlock economic opportunities that will enhance the country's ability to adapt to the rapidly changing climate and to realize socio- economic benefits from the transition to a lower carbon, greener economy – activities planned in this IP will be included in the NT's initiative with government oversight.
2. Potential for GHG Emissions Reduction/Avoidance	
Increased rate of renewable energy deployment	New alternatives of clean and reliable energy sources will reduce GHG emissions from the avoided and reduced use of coal power. Appropriate regulatory reforms and demonstrations of private sector investment could potentially facilitate development of more RE capacity installations with a significant reduction impact on CO2 emissions from coal-based power generation (provided this capacity is shutdown).
Reduction/avoidance of GHG emissions	An estimated GHG impact of 153,700 tonnes of carbon dioxide equivalent per year will be avoided from the implementation of the projects.

Contribution to technology development	The manufacturing of renewable power technologies involves a highly skilled workforce and a modernizing of the local industry base. Job creation and skills development are anticipated for the construction/installation, operation and maintenance of renewable technologies as well as smart grids.
Enhanced integration of climate-related risks	Clean energy and transport investments will enhance adaptation and resilience, making it easier for physical or natural systems to cope with climate change
Prevention of increased import dependency on fossil fuels	Anticipated reduction of electricity imports and will promote higher level of energy independence. Shifting from the traditional carbon-intensive baseload electricity sources which require fuel source imports and/or costly transportation (such as coal and oil) to renewables like wind, solar, geothermal, hydro energy (intermittent and distributed) would increase diversification.
3. Financial Effectiveness	
Value for money	Eskom is not able to fund financially and economically attractive investments without external financing. The daily operations depend on central government subsidies and most of financing must come from external sources. Energy policy reform is moving towards liberalization but the transition process is longer than expected by the government. Financial support is intended to promote the involvement of the private sector in the energy sector, specifically for renewable energy development.
Mobilization potential	The renewable energy installation demonstration projects and planned regulatory reforms will help to remove barriers in the energy sector where a number of private sector initiatives are waiting to proceed but are impacted negatively by perceived regulatory risks in South Africa.
Implementation potential	ACT support will address funding gaps related to the successful implementation of the IP activities, which DMRE, Eskom and private sector stakeholders will implement, including the accelerated retirement of existing coal power plants and their replacement with new sources of renewable energy, while ensuring a holistic, integrated, socially inclusive and gender equal just transition away from coal. It is important to identify a limited number of implementation partners to manage the implementation process, while remaining accountable for results. This risk is mitigated by working largely with Eskom for public sector implementation, with a provincial economic development agency such as the Mpumalanga Green Cluster Agency for much of the community-based development activities and with the private sector to expand investment in renewable energy generation. The M&E framework will be coordinated by the DFFE, the national ACT focal point, in order to maximize the speed, efficiency, and quality of implementation potential.
4. Just Transition	
Government stakeholders involved in consultations for this IP have committed to ensuring South Africa's Just Transition includes economic revitalization, job creation and community engagement in coal areas impacted by the transition and to protect the most vulnerable to climate change, in particular women, the youth and the marginalized. These consultations have influenced the design and scope of activities envisaged in this IP. Resources will be committed to developing a comprehensive just transition plan for the province and participating municipalities that focus on green growth strategies, alternate economic opportunities, poverty reduction and social protection related policies and programmes. Specifically, Eastern South African province Mpumalanga (which is home to almost all coal mines and coal-fired plants in the country) has high unemployment relative to South Africa's average unemployment rate and stimulating socio-economic development is critical to ensuring a just transition for the communities in the province. ACT support will be implemented with coordinated activities covering CFPP retirement, renewable energy generation in coal-dependent regions and socio-economic development in Mpumalanga.	
5. Gender Equality and Social Inclusion	
Gender equality/social inclusion considerations are integrated in coal-transition policies and strategies:	

- Women and vulnerable groups' influence increased through improved leadership and decision-making capacities
- Negative gender-specific impacts of transition mitigated
- Gender equality and inclusion in retention/redeployment, and social/economic regeneration programs
- Share of enterprises led by women and other excluded groups in CFPP repurposing and capacity replacement supply chains increased
- Share of socially responsible enterprises in CFPP repurposing and capacity replacement supply chains increased

Women will equally benefit from better energy security and reliability of supply, especially during daytime hours. It will reduce their time from collecting wood and other biomass for fuel use.

Each project in the Investment Plan also offers possible opportunities for targeted job creation for women (for example, requirements that the plant operators provide earmarked jobs for women). This will encourage private sector participation and create new economic activities and jobs related to these renewable energy technologies.

6. Development Impact Potential

Economic, social, environmental impacts	The planned renewable energy development is of minimal negative environmental impact, whereas their contribution to reduction of greenhouse gases and urban pollution in major cities is significant. The installations will provide training and capacity building, demonstration of technologies and employment opportunity extending to the most adversely affected economic regions of the country as a result of coal transition.
Markets of system impacts	The regulatory reforms and private sector investment related to the renewable energy installation projects is intended to promote the involvement of the private sector in RE development, including remote areas and economically adversely affected areas as a result of coal transition.

Annex 2. Assessment of Country Absorptive Capacity

1. The determinants for absorptive capacity can be classified into the following main groups: demand for the proposed development activities and investments, stability during the course of absorption and complementary factors essential to the implementation process⁷³. The country's capacity is assessed against determinants relevant to South African context to be enough to absorb the requested USD 500 million ACT funding for transition. In light of current electricity sector crisis and the substantial proportion of coal-fired power in the generation mix, the absorptive capacity in the power system is also briefly discussed against the suggested determinant groups.

Table A. 1 Determinants of Absorptive Capacity

Determinant groups	Factors relevant to ACT implementation	Factors relevant to power system
Demand	- Demand for ACT resources	- Demand for electricity - Underperforming coal fleets and unserved energy
Stability	- Stability of economic indicators	- Performance of reserves
Complementary factors	- Efficiency of public investments - Governmental strategy and policy environment - Renewable Energy Investment Potential - Access to commercial financing - Competitiveness of renewable energy cost	- Adequacy of transmission capacity

A.2.1. Factors relevant to ACT implementation

A.2.1.1. Demand for ACT resources

2. Demand for capital is a major driver of the absorption of investment in the country. The investment needs and costs to deliver an ambitious energy transition in South Africa is estimated to be at least USD 250 billion over the next three decades⁷⁴. Initial effects of Russia's invasion of Ukraine include the possibility of higher commodity prices and inflation⁷⁵, which may lead to a rise in capital demand in the near future. The requested USD 500 million in ACT financing represents only 0.2% of the total demand for energy transition, leaving room for additional funding. Moreover, not only can the ACT investment be adequately absorbed, but it is essential for leveraging additional investments that will comprise the \$250 billion energy transition costs.

⁷³ Berger, 1982. The concept of absorptive capacity: Origins, content and practical relevance, *Intereconomics*, ISSN 0020-5346, Verlag Weltarchiv, Hamburg, Vol. 17, Iss. 3, pp. 133-137, <https://doi.org/10.1007/BF02927883>

⁷⁴ Blended Finance Taskforce and Centre for Sustainability Transitions, 2022. Making Climate Capital work: Unlocking \$8.5bn for South Africa's Just Energy Transition.

⁷⁵ The Economist Intelligence Unit, August 4th 2022. EIU Viewpoint One-click Report: South Africa.

A.2.1.2. Stability of the economic indicators

3. There are numerous economic stability indicators, but the proposed investment plan uses only two: the ratio of public investments to GDP and the IMF's framework for evaluating the public debt's sustainability.

Adequacy of the scale of ACT investments compared to GDP

4. According to the International Monetary Fund (IMF), the proportion of public investments to GDP is one of the most important factors influencing the absorption capacity of public investments in developing countries. It has been empirically demonstrated that when public investment exceeds 10 percent of GDP, the productivity of public investment projects decreases. In 2019, the public investment-to-GDP ratio in South Africa reached 2.77 percent⁷⁶, continuing a steady downward trend. It is currently well below the 10 percent threshold, and assuming the trend does not abruptly reverse, the requested USD 500 million ACT investment at the scale of 0.15 percent of the 2020 GDP can be absorbed in the country without compromising investment efficiency.

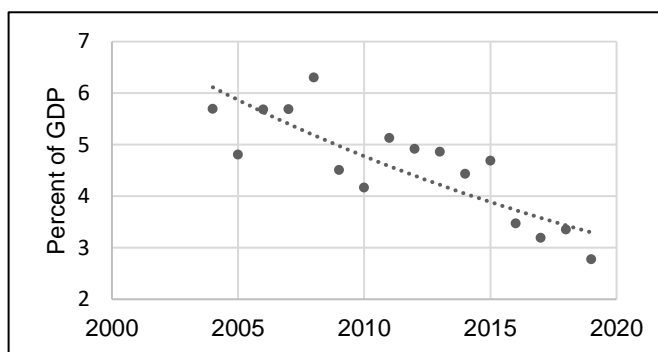


Figure A. 1 Trend of public investments in South Africa

5. Further, the economic growth outlook points to some recovery in the near term, although lackluster medium-term performance, which will create more room to absorb investments. Growth is estimated at 4.6 percent in 2021 and projected at 1.9 percent in 2022 led by private consumption—real output would rebound to its 2019 level by 2022. In the medium term, growth is projected to ease to 1.4 percent, capped by structural constraints to investment, prevailing policy uncertainty, and elevated public debt, which will hinder job creation.

6. However, there are main risks to the above stated baseline scenario relating to the pace of adjustment and reform and to evolving global liquidity conditions. Domestically, additional COVID-19 outbreaks amid slow vaccination uptake and slower than-expected progress in or reversals of policies and reforms would weigh on growth. Externally, growth could be hurt by weak economic performance in trading partners. On the upside, faster reform implementation would boost growth as shown in the Upside Scenario in Table A. 2. Also, terms of trade could remain favorable for a longer period, continue to support exports, and prolong a faster pace of output growth.

Table A. 2 Economic Output Growth Projection

		2020	2021	2022	2023	2024	2025
			Est.		Proj.		
Baseline	Real output growth (%)	-6.4	4.6	1.9	1.4	1.4	1.4
Scenario	Per-capita real output growth (%)	-7.8	3.7	0.3	-0.1	-0.1	-0.1
	Real output growth (%)	-6.4	4.6	0.9	-1.5	-0.9	-0.5

⁷⁶ Author's calculation using IMF data: World Economic Outlook Database (April 2022) and Investment and Capital Stock Dataset (ICSD) (last updated on June 15, 2022)

Downside Scenario	Per-capita real output growth (%)	-7.8	3.7	-0.6	-3	-2.4	-2
Upside Scenario	Real output growth (%)	-6.4	4.6	2.3	2.8	3.1	3.6
Downside Scenario	Per-capita real output growth (%)	-7.8	3.7	0.8	1.3	1.6	2

Source: IMF, January 21, 2022. IMF Country Report No. 22/37

7. Provided that public investment projects are more likely to be successful when undertaken during periods of higher economic growth⁷⁷, it is imperative that the country achieve the upside scenario through the adoption of well-sequenced structural reforms in conjunction with fiscal consolidation. *Operation Vulindlela* was introduced as a coordination mechanism to facilitate reform implementation. While the bulk of the agenda remains outstanding, some steps relevant to energy sector have been taken (e.g., easing regulations in the energy sector).

Public debt sustainability

8. IMF assessed that the government debt outlook remains challenging despite the fast rebound in output from the 2020 contraction⁷⁸. The COVID-19 pandemic significantly increased debt and debt service, exacerbating already unfavorable dynamics arising from persistent weak growth, high fiscal deficits, and a growing materialization of contingent liabilities from SOEs. Debt is projected at 88 percent of GDP by 2026 and not expected to stabilize during the projection period, while gross fiscal financing needs would average 17 percent of GDP in 2021–26. Risks to the debt outlook include the uncertain nature of the recovery, possible global financial tightening, additional spending pressures, and large SOE liabilities. While the currency and maturity composition of debt mitigate these risks, debt sustainability critically hinges on timely and credible policies to tackle the economy's fiscal and structural weaknesses.

9. As a monopolistic and vertically integrated electricity sector player in the country, Eskom is one of the key partners to implement the proposed ACT IP activities. However, Eskom's debt is unsustainable and bill collection is inadequate, despite various efforts for improvements. The ZAR 33 billion in cash flow from Eskom operations is insufficient to cover annual debt obligations (ZAR 69 billion). Eskom's guaranteed debt is ZAR 450 billion (representing 17% of total RSA debt and 55% of contingent liability from GoSA Guarantees), with R80 billion maturing within the next three years. The Sovereign will continue to provide Eskom with the necessary liquidity to meet shortfalls in its debt service obligations and Eskom is to be unbundled to improve its financial position; however, a credible strategy to address Eskom's debt situation must be implemented to demonstrate Eskom's financial viability without ongoing NT support.

10. Nevertheless, ACT support including CIF loans is crucial for the decarbonization for the economic growth and improved health and livelihoods in the country, and the country is willing to borrow. The coal transition will help improve debt sustainability in the long-term by mitigating the adverse impact of power outages on economic activities caused by the ageing coal-fired generating plants. According to CSIR, the disruptions affecting the economy was estimated at ZAR 60-120 billion in 2019. CIF concessional financing instruments are the best available option for the needed energy transition for its affordable lending rate and long maturities, thereby minimizing the additional burden on the already severe debt distress of the country. Without CIF financing, the country would become even more indebted, and or fall into a slump in pursuing its motivation for decarbonization.

⁷⁷ Presbitero, A., 2016. 'Too much and too fast?: Public investment Scaling-up and Absorptive Capacity', Journal of Development Economics 120, 17–31.

⁷⁸ IMF, January 21, 2022. IMF Country Report No. 22/37.

A.2.1.3. The efficiency of public investments in the country

11. IMF computed public investment efficiency scores using data envelopment analysis with public investment as a share of GDP and GDP per-capita as inputs and the quality of infrastructure from WEF's Global Competitiveness ranking as an output⁷⁹. South Africa scored 0.64 which belongs to the first top quartile among 62 developing countries where road infrastructure projects have been financed by the World Bank. South Africa's score of 0.64 places it in the first top quartile. A score of 0.64 for output efficiency indicates that the inefficient producer achieves 64% of the infrastructure quality score attained by the most efficient producers with the same inputs. This high score indicates that the nation is in a position to reap the benefits of ACT investments. Figure A. 2 depicts a box plot of the scores of 62 developing nations grouped into four quartiles.

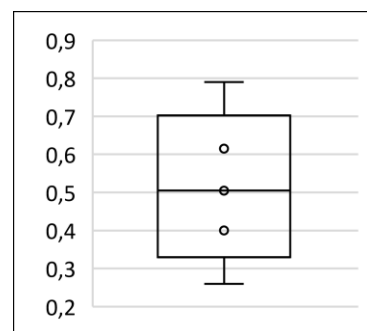


Figure A. 2 Summary statistics of Public Investment Efficiency Scores of 62 Developing Countries

A.2.1.4. Governmental strategy and policy environment

12. South Africa lacks a strategic and coherent policy on the Just Energy Transition, which causes political tension, polarization of the energy debate, and impedes the power sector reform agenda and public and private energy sector investments. Although a unified long-term coal transition strategy is yet to be developed, the president's dedication to the energy transition is strong. In his address to the nation on the energy crisis on July 25, 2022, President Cyril Ramaphosa announced that climate funding through the Just Energy Transition Partnership will be utilized for the repurposing of CFPPs and replacing coal-based generation capacity⁸⁰. ACT support, as part of the broader JETP, will kick-start the coal transition in the country by focusing primarily on the electricity sector and mitigating the immediate social impacts to address the country's energy crisis in a sustainable and socially just manner in coordination with Eskom, while the long-term strategy is being developed.

A.2.1.5. South Africa Renewable Energy Investment Potential

13. Private sector participation in solar PV and wind generation investments has been robust, involving both energy sector and banking sectors. The country's financial services industry is highly developed and dominated by private banks. The banking industry has ample capital and a solid balance sheet. Through the Renewable Energy Independent Power Producers Program (REIPPP), the private sector has added 6 GW of installed capacity, representing approximately 8% of the nation's generation capacity. The REIPPP Bid Windows are typically oversubscribed, as numerous producers and financiers in the renewable energy sector are already mobilized. Given their track record, they are in an excellent position to fund RE as repurposing and capacity replacement solutions.

14. Although potential PPP arrangements for CFPP repurposing and coal capacity replacement under

⁷⁹ IMF, 2020. *Ibid.*

⁸⁰ Address to the nation on energy crisis by President Cyril Ramaphosa, July 25, 2022 (<https://www.gov.za/speeches/president-cyril-ramaphosa-address-nation-energy-crisis-25-jul-2022-0000>)

the ACT program have not yet been identified in detail, two conditions would be necessary to attract private sector interest: (i) If RE capacity is procured through REIPPP, which requires consultations and approvals by NERSA, concurrence by NT for their contingent liabilities, and DPE for Eskom to enter into PPAs, these essential steps of the approval process must be better coordinated and accelerated. (ii) the electricity market has to be further liberalized. While measures to improve Eskom’s financial position, including unbundling and fiscal resource injection, are being taken, the market structure has to move away from the Eskom single-buyer model. A diversified pool of credible off-takers will attract private investments in RE generation capacity, without unsustainable long-term Eskom PPA backstopped by fiscal resources. This change is considered feasible provided that the recent Eskom land lease program was oversubscribed by three times with 18 successful bidders for 1.8 GW capacity without Eskom PPA and NT guarantee.

A.2.1.6. Cost competitiveness of renewable energy

15. Current renewable tariffs are sufficiently competitive to disincentivize coal power projects, making CFPP repurposing and capacity replacement feasible. It is noted that per Bid Window 5 of REIPPPP, solar tariff ranges between USD 23.47/MWh - USD 30.35/MWh and Wind tariff USD 21.56/MWh - USD 38.69/MWh. It is comparable with Eskom’s operational cost of generation from its coal fleet at USD 27.29/MWh. Observations indicate that the LCOE of newly constructed renewables is comparable to the marginal cost of coal generation. Given the capital cost of a coal power plant and the declining costs of renewables, the latter is anticipated to become cheaper. Figure A. 3 depicts the significant price reductions over time in the REIPPPP's competitive bidding process.

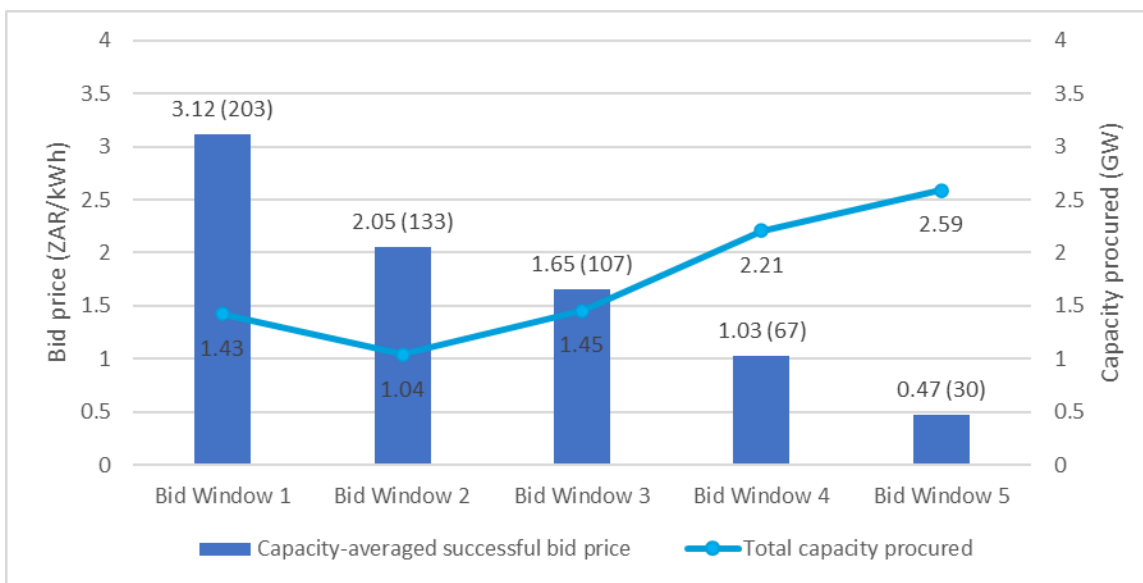


Figure A. 3 Capacity-Averaged Successful Bid Prices^{81, 82}

16. The addition of energy storage to renewables causes the cost to exceed that of coal generation, but the trend is downward. The below table compares shows annual estimates for levelized cost of energy

⁸¹ Black & Veatch, 2022. Technical and Financial Approaches to Repurpose Coal Assets: Case of India, Indonesia and South Africa, work in progress

⁸² Prices in 2021 ZAR. The figure excludes Bid Window 3.5 as the capacity procured was only 200 MW. Values in parentheses indicate equivalent in USD/MWh; exchange rate used: 1 ZAR = 0.065 USD.

from coal and RE + storage from the EPRI (for 2017) and Lazard.

Table A. 3 Levelized Cost of Electricity for Coal and RE + Storage

Year	Estimation Entity	Coal	RE + Storage
2017	EPRI	97.53 USD/MWh	452.56 USD/MWh
2018	Lazard	101.50 USD/MWh	124.00 USD/MWh
2019	Lazard	109.00 USD/MWh	120.50 USD/MWh
2020	Lazard	112.00 USD/MWh	110.50 USD/MWh
2021	Lazard	108.50 USD/MWh	121.50 USD/MWh ⁸³

Source: EPRI and Lazard

A.2.2. Factors relevant to power system

A.2.2.1. Demand for electricity

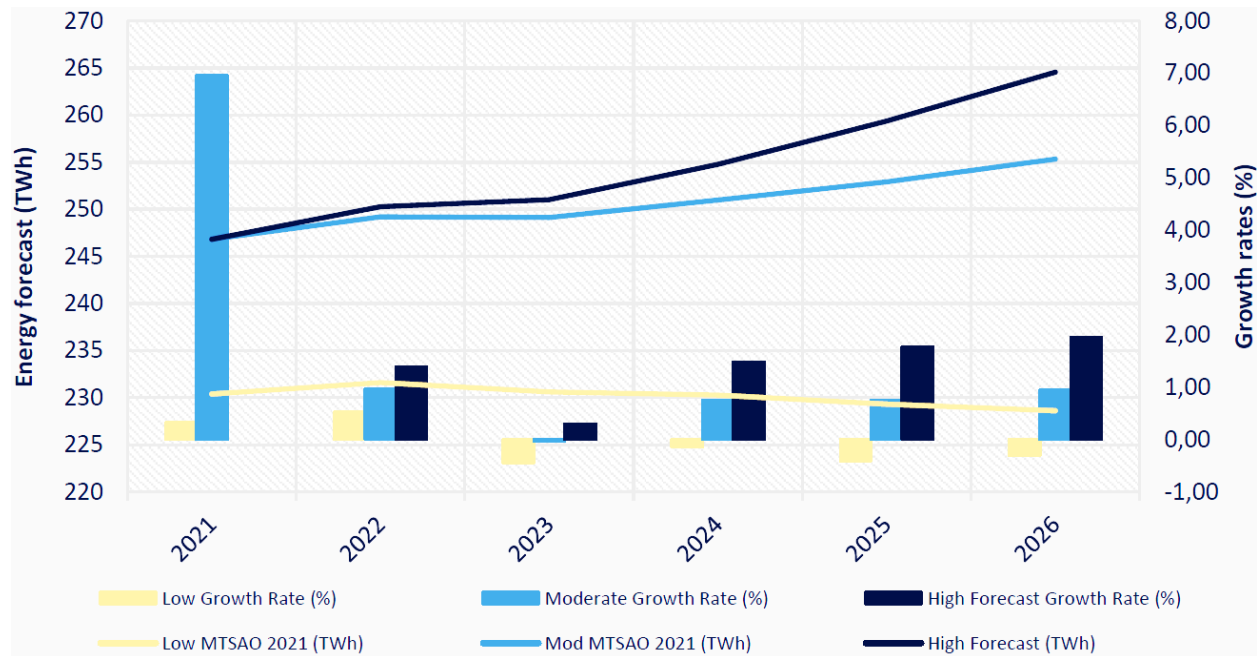


Figure A. 4 Possible energy demand forecasts

17. The forecast for electricity demand in the medium term indicates a moderate but steady expansion. Eskom developed three demand forecasts for consideration in the Medium-term System Adequacy Outlook 2022-2026, as depicted in Figure A. 4⁸⁴. The demand forecasts in dark and light blue curves were derived within Eskom Transmission, based on GDP projections as inputs. The light blue line, termed "moderate demand", has an average annual growth rate (AAGR) of 0.7% from 2022 to 2026. The dark blue line, with an average annual growth rate of 1.4%, anticipates much stronger recovery following

⁸³ The LCOE estimate by Lazard for 2021 can be benchmarked against the only winning bid in the RMIPPPP that offered solar PV + BESS at an LCOE of 1,885 ZAR/MWh (~130 USD/MWh).

⁸⁴ Eskom, October 30, 2021. "Medium-term System Adequacy Outlook 2022 - 2026"

the COVID-19 pandemic from 2023. The bottom line (yellow) is derived from Eskom’s sales projections from customers as an input and this demand is similar to the 2020 actual demand of 229 TWh reported by Statistics SA (Stats SA, 2020) and is considered too low for resource planning.

A.2.2.2. Underperforming coal fleets and unserved energy

18. Due to the poor performance of the existing coal fleet, coal transition is required immediately to meet both current and medium-term demand, despite the fact that demand growth is anticipated to be moderate. Considering the average age of the old coal fleet, which is 41 years, and the associated reliability issues, it is and will continue to be difficult to consistently meet the baseload capacity. The older stations are susceptible to failures due to a prolonged lack of maintenance. Eskom continues to implement its Reliability Maintenance Recovery Programme on the coal-fired generation fleet in an effort to reduce unscheduled maintenance, but the effects have not yet been observed on all units. In addition to the technical performance of the generating stations, there are other risks that could lead to capacity loss, such as non-compliance with minimum emission standards and late issuance of operating licenses. Some Eskom coal stations are in violation of the Air Quality Act and may be forced to close. This event will have a significant impact on the power grid, and there are no credible resources available to replace this capacity.

19. In order to maintain a stable power system, the System Operator implements load shedding and/or demand reduction in the event of a supply shortage. The amount of energy not supplied historically due to emergency load reduction is 1.15 TWh, as shown in Figure A. 5. Even though 2020 was a year with an unusually low load, load reduction did not decrease significantly compared to 2019, indicating an inadequate system. The values include load shedding and load curtailment but exclude interruption of supply (IOS). IOS refers to all contracted and mandatory demand reductions to maintain system frequency and security of supply within acceptable bands.

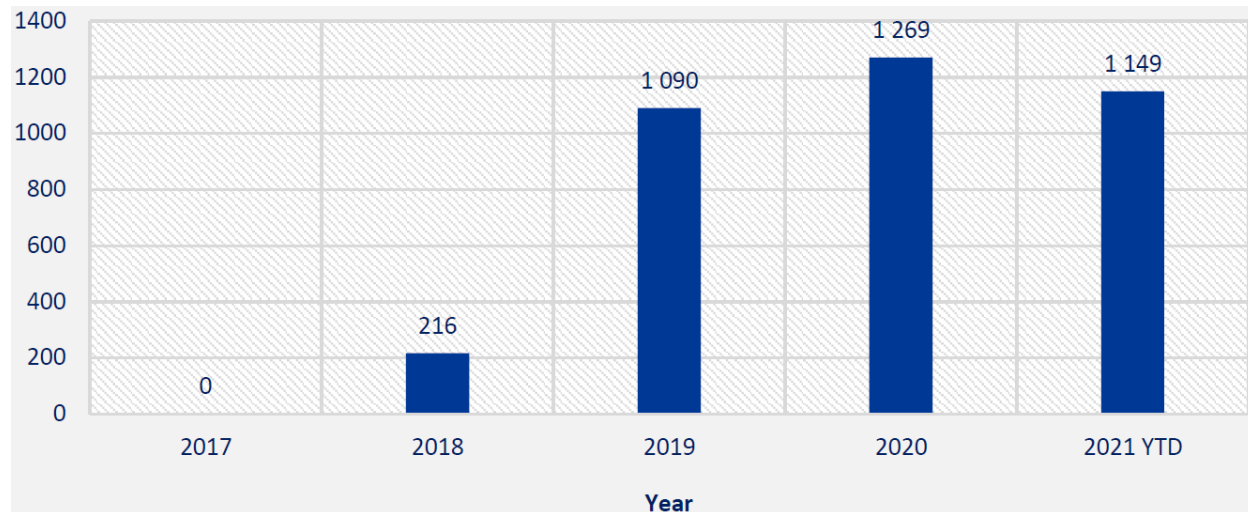


Figure A. 5 System Operator instructed load shedding for the calendar year 2017 to 2021 YTD (GWh)

20. In March 2022, NERSA estimated Eskom’s total economic cost of unserved energy (COUE) for 2020

to have been over R100 per kWh.⁸⁵

A.2.2.3. Performance of reserves

21. The Eskom System Operator (SO: Ancillary Services, 2019) stipulates the type (instantaneous and regulating reserves) and capacity in MW required to restore system frequency to acceptable levels, depending on the drop in the level of frequency. Frequency incidents are correlated to performance of reserve deployment. Given the identified risk of reserve shortages due to underperformance of Eskom stations contracted to provide reserves, monitoring this index is critical in alerting the System Operator to an increasing trend in frequency incidents.

22. Although fewer generation trips led to frequency decay in 2020, the $49,5 < f < 49,7$ Hz band experienced a total of 983 incidents, an increase compared to 848 in 2019 and 379 in 2020. The system also experienced a spike in over frequency in the 50,3 Hz band. The actual incidents for the period January to September 2021 are shown in Figure 22 below. There were no incidences of frequency dropping below 49,2 Hz; such an incident would automatically activate underfrequency load shedding. While the number of incidents indicates that the lack of system's ability to react to varying outputs from generators, the proposed CFPP repurposing and coal capacity replacement concept aims to minimize the adverse impact of variable renewables on the system stability by combining with energy storages.

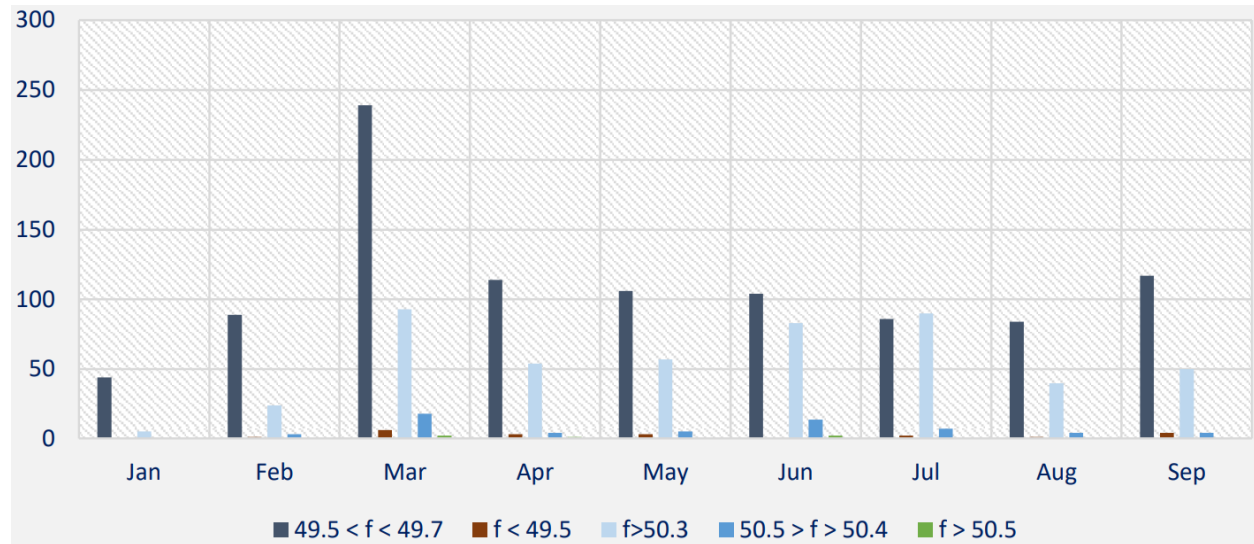


Figure A. 6 Actual frequency incidents 2021 YTD

A.2.2.4. Adequacy of the transmission capacity

23. The transmission capacity for power evacuation from the renewable power generation to be built under ACT program to the load centers need to be assessed for each generation capacity development activity, given the lack of transmission capacity to effectively handle new renewable power at the entire country level, in particular, Northern and Eastern Cape. The periodic Generation Connection Capacity

85 https://www.nersa.org.za/wp-content/uploads/2022/05/Decision-and-RfD_Eskom-COUE-Methodology-Review-and-2020.pdf

Assessment by Eskom shows that the inter-province transmission capacity for power evacuation from North West and Northern Province with maximum renewable generation potential is observed to be minimal. However, it shows that a transmission capacity is available between Mpumalanga, where the target CFPPs to be decommissioned are located, and Gauteng, the biggest load center.

Annex 3. Summary of Stakeholder Consultations

1. Stakeholder consultations were held in May 2022 with government agencies, Eskom, development partners, private sector, civil society, and academia. The complete list of participants is included in the tables at the end of Annex 3. During stakeholder consultations, concerns were primarily raised by Civil Society Organizations regarding the potential impacts of decommissioning CPPs on the related coal value chain, including coal mines. These impacts are being studied at the plant level as well as the provincial level by various stakeholders. Given the depth and breadth of engagement required in this area, some of the well-defined elements could be captured in the ACT IP and studies could be funded for future activities. Various stakeholders shared their views that significant support needs to be provided to the 'People' pillar of the ACT IP to the extent possible. MDBs advised that incorporating the 'People' element into the investment projects would strengthen the overall quality of the IP and is in line with the ACT design document. MDBs also acknowledged that support for CPP workers and communities under the proposed Komati project could be replicated for the retirement of other CPPs, if proven successful.

2. MDBs and Eskom also discussed off-grid access as potential additional area for private participation. Off-grid could be eligible for ACT funding if: (i) the ultimate beneficiaries are the people and communities that are affected by coal phase-out (ii) it entails job creation, re-skilling and economic revitalization. Containerized microgrids could be a possible option in that regard. Eskom stated that they intend to maximize local content and innovations in containerized microgrid space.

3. In terms of replacement generation capacity for retired coal plants, there was concurrence on the role of gas in energy transition across the wider stakeholder groups including Eskom and private sector actors, but it was also confirmed to all stakeholders repowering involving dispatchable thermal generation using natural gas is not eligible for ACT supports. Consultations with private sector stakeholders also focused on factor that affect private sector investment mobilization:

- a. while the license exemption for the generators under 100 MW is a step in a positive direction, the regulatory requirement remains onerous. National Energy Regulator of South Africa (NERSA) registration necessitates virtually the same level of preparation as license (although NERSA showed recent signs of process acceleration)
- b. transmission capacity is constrained, which was also emphasized during the private sector meeting,
- c. the land use policy requires re-application for approval of the changed use of land (e.g., in case of converting a mine land into a renewable site, which became irrelevant as the IP is scoped within the electricity sector).

4. It was also concluded that since many of the private sector activities as well as the community development activities are focused on the Mpumalanga province, these could be potentially integrated under a Mpumalanga economic development program to supported affected communities.

5. Below is a list of all organizations from each sector that participated in stakeholder consultations.

Public Sector Stakeholders
DFFE
National Treasury

DMRE
Eskom
Presidency of South Africa

Development Partners/Donors
French Development Agency (AFD)
Development Bank of South Africa (DBSA)
European Investment Bank (EIB)
New Development Bank (NDB)
US State Department
UK High Commission
Denmark Embassy
British International Investment
KfW
Development Finance Corporation
Cao Jingtao
Megan Taylor
EU
Power Africa
Res4Africa Foundation
Transfer Africa Foundation

Civil Society and Academia
Centre for Scientific and Industrial Research
National Labour and Economic Development Institute (NALEDI)
Just Share
Centre for Environmental Rights
Trade and Industrial Policy Strategies (TIPS)
Green Cape
University of Pretoria
Groundwork
Stellenbosch University
Mpumalanga Green Cluster Agency
CIF Observer

Private sector
Industrial Development Corporation
SAESA
Sanlam
Marubeni
Vestas
South African independent Power Producers Association
British International Investment
Bushveld Energy

Mainstream Renewable Power
Sasol
Nedbank Capital
National Business Initiative
Standard Bank

MDBs
AFDB
IFC
WB
CIF Administrative Unit

Annex 4. Development Co-Benefits

Results	Development Co-benefits	Description
Accelerated transformational change toward net-zero emissions and inclusive, climate-resilient development pathways	Reduced greenhouse gas (GHG) emissions	The accelerated decommissioning of the three CFPPs will result in approximately 71 million tons of CO ₂ over the project lifetime.
	Diversification and energy security	This IP will facilitate a reduced dependence on fossil fuels and will promote a higher level of energy independence. Shifting from the traditional carbon-intensive baseload electricity sources which require fuel source imports and/or costly transportation (such as coal and oil) to renewables like wind, solar, geothermal, hydro energy (intermittent and distributed) would increase diversification and also reduce the need for electricity imports. Diversified energy mix reduces vulnerability due to climate impacts, minimizes the volatility of primary energy costs, and encourages technological competition between energy platforms, ensuring that progressive innovation takes place and that costs are minimized.
	Health benefits	Moving towards green and clean fuel will help reduce the health-related impacts leading to acute respiratory infections, tuberculosis, chronic respiratory diseases, lung cancer, cardiovascular disease, asthma, low birth weights, diseases of the eye, and adverse pregnancy outcomes due to inhalation of toxic emissions released from coal-based power plants. This will eventually help in saving cost on the health front. In the residential sector, increased electrification through cleaner resources reduces the use of coal for cooking and heating in homes - which will also contribute to overall improvements in health, resulting in long-term cost savings in healthcare.
Accelerated transition away from coal-powered to clean energy while ensuring a holistic, integrated, socially inclusive and gender equal just transition	Household benefits for women	Renewable technologies replacing coal power will generate electricity during high-demand daytime periods and will similarly enhance supply adequacy and reliability during the hours of the day in which the value of lost load and losses are typically the highest. Women will equally benefit from better security and reliability of supply, especially during daytime hours. It will reduce their time from collecting woods and other biomass for fuel use.
	Transport sector environmental benefits	Coal transportation by water, rail and roads are responsible for pollution, congestion, high fuel consumption, road accidents etc. Not having to transport coal could have a positive impact with lesser marine pollution due to ships transporting coal. This will also lead to decongestion of road and rail infrastructure which are already stressed in developing countries. Hence, decommissioning has the potential of reduction in consumption of transportation fuel which will lead to minimal vehicular emissions.

Sources of income created for affected employees through job retention or job creation	Alternative livelihoods for locals impacted by coal transition	This IP will ensure additional benefits for communities in the vicinity of projects participating in the REI4P. RE projects are primarily located in rural communities, frequently categorized as “marginalized communities”. The REI4P has created a legal framework to incentivize IPPs to channel benefits to communities near RE project sites through a range of means, including local employment quotas, community ownership in RE projects, as well as contributing a proportion of their revenue towards development spending, known as socio-economic development (SED) and enterprise development (ED) spend.
	Increase in employment	The implementation of this IP will support job creation and skills development related to the construction/installation, operation and maintenance of renewable technologies as well as smart grids. Jobs in renewable power generation are concentrated in the services, construction and manufacturing sectors. However, employment opportunities are created in almost all sectors – including the mining sector, which will result in net increase in employment despite the expected job losses in coal mining.
	Green job creation	Renewable power sources also contribute to local economic growth and, according to some, provide better jobs. The manufacturing of renewable power technologies involves a highly skilled workforce and a modernizing of the local industry base. The use of renewable energy makes local businesses less dependent on imports from other regions, frees up capital for investments outside the energy sector, and serves as an important financial hedge against future energy price spikes
Affected communities equipped with relevant skills for jobs of the future	Workforce upskilling	As more skilled workers are required in the RE technology sector compare to coal, the shift has the challenge to build the technical capacities through established training institutes and education. Upskilling education of the workforce in the deployment of these technologies will be prioritized. Each project in the IP also offers possible opportunities for targeted job creation for women (for example, requirements that the plant operators provide earmarked jobs for women). This will encourage private sector participation and create new economic activities and jobs related to these renewable energy technologies.
	Skill building training	The number of jobs estimated to be created in 2018-2030 period (IRP and CSIR models) will range between 580,000 and 1.2 million depending on the expansions of the RE options to produce electricity ⁸⁶ . This requires significant funding support to reskill the unemployed coal employees by the South African Government. The funding support of \$2 billion over the period of 3 to 5 years will surely have the focus on training and educating the coal and thermal power plant workers to get suitable employment in the alternative technologies (solar,

⁸⁶ IASS and CSIR, "Future skills and job creation with renewable energy in South Africa," IASS and CSIR, Pretoria, 2019.

		wind, Synchronous condensers, battery + solar PV) in addition to other manufacturing sectors like electric vehicles.
Transition to cleaner energy sources	Reduction in pollution	Transitioning towards the use of non-fossil fuels can help improve the environmental conditions and subsequently reduce the pollution load. Reducing CO2 emissions from electric power generation will simultaneously reduce the emissions of sulfur dioxide (SO2), nitrogen oxides (NOx), and particulate matter such as PM 2.5. Reduced coal power production will also result in significant reductions in water pollution and overall water consumption.
	Prevention from Disasters and Climate Change Vulnerabilities	Transitioning towards clean energy will minimize the eventual, severe impacts of climate change as well as improvements in resilience and adaptive capacity to natural disasters. The primary climatic benefits of clean energy stem from the fact that immediate efforts can stop the buildup of GHG's in our atmosphere. Clean energy and transport investments will enhance adaptation and resilience, making it easier for physical or natural systems to cope with climate change

Annex 5. Project Concept Briefs

A.5.1. Project 1 – Retiring and Replacing Coal-based Power Generation Capacity

A.5.1.1. Background

1. Environmental and technical concerns require the retirement of South African CFPPs. The country's electricity sector heavily relies on a fleet of CFPPs representing 87% of the country's installed generation capacity of 52 GW that contribute 48 percent of South Africa's total CO₂ emissions. At the same time, the electricity users face frequent outages due to the low reserve margin and decreasing electricity availability factor of the incumbent ageing CFPPs. Eskom's ageing coal fleet of 15 power plants have an average age of 41 years, with some plants that are prime targets for accelerated decommissioning. Decommissioning of these target plants is expected to pave the way for the country to decarbonize its electricity sector and make progress toward meeting its NDC commitment.

2. As part of the effort to accelerate the retiring of CFPPs, there will be a need to quickly scale up the investment in power generation to close the resulting generation capacity gap. Various approaches need to be considered to ensure that the power sector, including both public and private sectors, can respond efficiently and effectively to fill in the needed renewable power generation. Given the intermittent nature of renewable energy, it will also be increasingly important to ensure that there is dispatchable power that could be called upon, as needed. Aside from thermal power options, there are different energy storage technologies that have been deployed on a limited basis in South Africa and could be scaled up or new proven technologies could be introduced.

3. While the addition of new power generation capacity and energy storage require private sector investment along with public sector, some of the recent changes may require a risk mitigation mechanism for private sector participation. There are uncertainties in the national guarantees for Eskom to enter into power purchase agreements (PPAs). Also, the regulation has been changed to allow PPAs to be entered directly between private sector entities, as well as other entities such as municipalities. There may be growing uncertainty and apprehension to enter into PPAs, unless a risk mitigation mechanism such as a guarantee could be incorporated.

A.5.1.2. Project Objective

4. The objective of this project is threefold: (i) demonstrating the ways to ramp up the process of decommissioning Eskom's CFPPs by public sector that can be further scaled up even after ACT intervention, (ii) Enabling the acceleration of decommissioning by creating power supply capacity from renewable sources through a series of public and private sub-projects, and (iii) creating opportunities for the retired CFPP workers and the affected communities, to meet South Africa's energy security, climate change and poverty reduction targets.

A.5.1.3. Proposed Approach

5. The project will comprise three components to achieve its three-fold objectives.

6. Component A involves decommissioning of the power stations. Decommissioning entails the entire process of permanently shutting down the coal power generation capacity and disconnecting it from the system, demolition and blasting activities, and site rehabilitation.

7. Based on the retirement schedule of Eskom-owned CPPs, three plants have been identified to be shut down under the ACT support. CPPs with the earliest retirement dates are Camden, Hendrina, and Grootvlei. Camden Power Station was first commissioned in 1967 with a total installed capacity of 1,600MW consisting of eight units. Between 1988 and 1990, all of Camden's units were decommissioned. However, due to increasing demand Eskom initiated return-to-service program of its mothballed coal plants and Camden was the first one to be recommissioned between 2005-2008. It is now being considered as one of the priority plants to be decommissioned and repurposed before 2030.

8. Grootvlei Power Station is situated approximately 18 km south-west of Balfour in Mpumalanga. It has a total installed capacity of 1200 MW comprising 6 units, each of which has a nominal capacity of 200 MW. One of the older plants in Eskom's fleet, it was commissioned in 1969 and temporarily ceased operations starting in the years between 1988 and 1990. However, due to growing demand in the 2000s, Grootvlei has been brought back to service since 2008 and has been operational with a current available capacity of 560MW, which accounted for 1 percent of Eskom's overall capacity in 2021.

9. Hendrina Power Station is located at 40km south of Middelburg in Mpumalanga. The first unit was commissioned in 1970 and the last in 1977. It was then refurbished in the mid-90s. At the time it was built it was the largest station to be designed by Eskom. It has a total capacity of 2000MW with 10 units of 200MW. Together with Camden and Grootvlei, Hendrina Power Plant is considered to be decommissioned and repurposed before the end of 2025.

10. Component B focuses on repurposing the CFPPs and replacing the retired coal-based generation capacities. The repurposing and capacity replacement solutions include solar PV, wind, energy storage, and synchronous condensers⁸⁷ as optimal technologies. The Component will involve a broader range of investors and developers, including both public and private sector to add renewable generation capacities to the immediate CFPP sites, surrounding areas, and in broader coal regions. Among various financing model and risk mitigation arrangements to be explored, a study on possible PPP structure to repurpose the three Eskom CFPP sites are planned to be carried out by Eskom.

11. The repurposing and the capacity replacement will occur simultaneously with decommissioning under a 'two-phased approach' to assure the nation's energy security in light of current power shortages. The initial repurposing and capacity replacement phase will focus on areas where there is no (or limited) infrastructure installed and where new technologies could be developed and procured as soon as the final technical design is agreed upon, and while decommissioning is ongoing at the plant site and ash dams. Once the main plant and associated facilities are demolished and the ash dams are rehabilitated, phase 2 of repurposing will include the additional installation of RE capacity and auxiliary infrastructure to the immediate CFPP sites. Phase 2 repurposing can only be implemented once the decommissioning is completed, the sites are cleaned up and the repurposing design is consistent with the environmental remediation and closure plans.

12. In terms of business model and financing for repurposing and capacity replacement, ways to promote private sector participation is being identified. Depending on private sector appetite and interest, different interventions for each private sector sub-project are to be provided. One possible way of intervention is a guarantee mechanism. Due to Eskom's weak balance sheet all PPAs entered into by Eskom (i.e., DMRE Procurement Programmes) include a national government guarantee, although a weakening fiscal position and an alarming level of government's contingent liabilities suggest this is

⁸⁷ General Electric, *Synchronous Condenser Technology Overview*, White Paper prepared for the World Bank, 2021.

unsustainable over time. This provides an opportunity not only for IPPs with Eskom offtake but also for traders to provide the much-needed liquidity in the private electricity generation and private energy trading market.

13. The underwriting of the REIPPP programme by sovereign guarantees has led to more competitive bid prices and has provided a strong impetus to the local renewable energy industry. One of the unintended consequences of the REIPPP programme is that the highly competitive process resulted in many bankable and well-structured projects being conceptualised of which only a share would be commercialised as winning bidders. This has resulted in many excellent projects being stranded. Stranded projects now have the opportunity to be developed to supply power to the commercial and industrial sector due to two significant energy supply industry (ESI) developments. The first is the permission for private suppliers to wheel power through the national grid from a generation source to any consumer. The second development is the removal of generation license requirements for IPPs with private sector PPAs.

14. As a result of these developments, the previously REIPPP stranded but shovel-ready capacity provides a significant opportunity for energy trading to connect these IPPs to creditworthy off-takers across the country. It must be noted that many private renewable electricity generation projects have to date taken place 'behind the meter' (i.e., embedded generation) as this was until recently the most practical approach to self-generation since it does not involve Use of System (UOS) agreements, wheeling by Eskom or municipalities and is not subject to economic regulation.

15. As different private entities move into the role of aggregators or energy traders, there may be a need to consider a financial guarantee to cover the guarantee requirements from IPPs to secure PPAs for installed renewable energy capacity. This could help unlock hundreds of MWs of power into the ESI.

16. Component C aims to create opportunities for workers and communities affected by decommissioning and repurposing of the decommissioned coal power plants while minimizing the adverse social and economic risks and impacts. Specific activities under this component will include reskilling /upskilling of workers and community members in the renewable energy sector; investments in SMMEs to strengthen livelihoods and jobs opportunities to reduce coal dependency and generate alternate employment opportunities⁸⁸; and mechanisms for enhancing stakeholder engagement and enabling communities to participate in transition planning and decision-making.

17. Investments in activities under Component C will seek to strengthen women's roles as employees in particular in technical roles that aim to pursue a permanent job, entrepreneurs while supporting those affected by the transition. Targeted activities will be identified to address key gender gaps, including: (i) actions to promote female employment (e.g., training for HR, management and women that seek for jobs, capacity building activities), (ii) support to women-owned- and youth-led enterprises (e.g., financial literacy, business development services); (iii) implementation of preventive measures to mitigate associated incidents or risks (e.g., gender based violence, work place incidents such as sexual exploitation and abuse/sexual harassment) in the project implementation areas; and (iv) facilitating women's participation and voice during consultations, local level planning, decision-making and leadership roles. Each project will include gender-specific indicators to monitor progress in terms of closing the gender gaps in relation to women's labor force participation, access to economic opportunities and increases in voice

⁸⁸ One of the plans to create alternative employment opportunities is a climate-smart, labor-intensive agricultural development pilot at Grootvlei power station site. A pre-feasibility study will be conducted by Eskom and the Netherlands Embassy

and agency.

18. Notably, some of the activities under Component C fall beyond Eskom's mandate. Accordingly, it is envisaged that the implementation of Component C activities will significantly be aided by the progress made under the EJETP in Komati. In particular, the trainings and skills development will be accessible through the Komati Training Facility while the partnerships and coordination mechanisms developed with the provincial/municipal authorities, relevant government department, private sector and civil society organizations will support in the implementation of broader local and community development activities that fall outside Eskom's expertise and responsibilities.

19. Understanding these challenges, risks and opportunities associated with the decommissioning, repurposing, and capacity replacement processes, upfront planning to make the transition just for workers and communities in coal-dependent areas, and implementing strategies to mitigate the social and economic impacts, will be key to ensuring the success of the just energy transition agenda. To assess the overall impact of the Eskom Just Energy Transition, (i.e., coal plant retirement as set out in IRP 2019), a Strategic Environmental and Social Assessment (SESA) will be prepared under this project. The SESA will use analytical and broad-based participatory approach to identify the impacts of the larger process of closing multiple coal-fired power stations, especially the effects on workers and communities, supply chains, and the coal sector generally. The SESA will provide a tool to support strategic planning for implementation of Eskom's JET Strategy while effectively managing the environmental and social aspects of the transition process.

A.5.1.4. Implementation Readiness

20. The decommissioning and repurposing of the immediate three CFPP sites and outer land will be implemented by Eskom and will build up on Eskom's previous experience of implementing CTF financed projects, including Renewables Energy Support Project, and EJETP implementation arrangements to be tried for Komati plant. The implementation of the project will be coordinated directly by the Office of the Eskom CEO overall, among the implementation of components and project monitoring and reporting requirements. Within the Office of the CEO there are two distinct functions: the JET Office (JETO) and the Clean Energy Unit (CEU). The JETO drives strategy, advocacy and JET stakeholder management; including with funder relationships and will provide oversight on the overall Eskom JET programme, with the CEU responsible for implementation.

21. For broader coal-based generation capacity replacement activities, in particular by private sector, IFC (together with other relevant DFIs) closely follow the developments on the market driven by the regulatory and policy regime set by the Government of South Africa. With the continued developments across the country, particularly with anticipated push in CFPP retirement in the Mpumalanga region and acceleration of RE penetration across the country, it is expected that the sub-projects will start gaining traction in late 2023 and will advance to the Board approval stage in 12-18 months from that.

A.5.1.5. Rationale for CTF ACT financing

22. ACT financing, along with co-financing by MDBs and other development partners and the philanthropic community, will support South Africa to catalyze and build momentum on the implementation of its program to accelerate transition from coal. The identified three coal power stations, will be among the first projects to decommission as part of South Africa's plan to retire 12GW of coal power plants by 2030. CTF ACT financing will help to overcome first-mover costs, build confidence among local stakeholders and communities and accelerate the participation of private developers as well as

commercial lenders along the process. These will, in turn, build on investor confidence and ensure long-term financing of future coal plant closures and repurposing and capacity replacement, including support by other development partners and the philanthropic community to help accelerate South Africa’s transition from coal.

23. With the expected transition away from large quantities of baseload power from coal, South Africa will need to double down on closing the gap between energy supply and demand. This will unavoidably include the need to attract large investment to transform the economy to a new green future; most of this investment volume will have to come from private sector. No sizeable or sustainable coal transition process can be designed without rapid growth of investment in the replacement firm power generation infrastructure. While, thanks to multiple successful rounds of the REIPPPP program, RE generation market in South Africa is substantially commercial, the sector requires further strengthening in order to reduce the reliance on national government guarantee and, more significantly, the sector requires definitive and careful support to stimulate the growth of the firm load RE power generation. This creates a case for the ACT support to private sector activities to demonstrate areas for further investment and together to catalyze new economic opportunities. Once the precedents are set, established models and approaches can be scaled up.

24. In case of BESS for CFPP repurposing, the project can build on some initial experiences in South Africa for utility-scale BESS, including a large Eskom project funded by the World Bank utilizing resources from the Clean Technology Fund. However, the novelty of this segment will require support and potentially concessional funding to facilitate the entry of private sector players and investment.

25. The ACT builds upon the World Bank’s USD366 million Eskom Just Energy Transition Project (EJETP) and will leverage the USD8.5 billion Just Energy Transition Partnership (JETP) announced at COP-26.

A.5.1.6. Indicative Financing

26. Indicative costs for project components are listed as follows:

Table A. 4 Indicative Financing Plan for Project 1 Retiring and Replacing Coal-based Power Generation Capacity

		(US\$ million)			
		Total	Camden (Jan'23 - Nov'25)	Hendrina (Mar'23-Dec'25)	Grootvlei (Mar'26 - Sep'27)
Component A:					
Decommissioning		150	49	49	52
Shutdown, demolition, rehabilitation		150	49	49	52
Component B: Repurposing and capacity replacement		2,000	711	780	509
Phase I		1,556	505	689	362
PV	MW	453	185	168	100
	Cost	477	195	177	105
Energy storage	MW	450	150	150	150
	Cost	878	311	311	256
Wind	MW	120	-	120 ¹	-
	Cost	186	-	186	-

Synchronous Condensers	# Cost	1 16	- -	1 16	- -
Phase II		444	205	91	147
PV	MW Cost	205 235	75 85	80 91	50 60
Wind	MW Cost	122 208	72 120	- -	50 88
Component C: Socioeconomic impact mitigation		200	68	68	63
Transition for Eskom Workers		38	15	15	9
Economic Diversification		149	50	50	50
Stakeholder Engagement		13	4	4	4
Project Total		2,350	828	898	624

¹. For Hendrina power station, wind power generation could be part of Phase 1 repurposing because enough data is available from a wind study carried out by Enertrag, despite the general time requirement for minimum 12 months for site specific measurements at minimum 80 percent of expected hub height.

A.5.1.7. Results Indicators

27. The decarbonization of the electricity sector and the concomitant retirement of CFPPs is anticipated to present positive environmental impacts. Closure of the power station will result in immediate reductions in air emissions that will improve ambient air quality. Potential emission reduction from decommissioning is expected to reach approximately 71 million tons of CO₂⁸⁹. Likewise, while the impact of the plant closures on the jobs of those directly employed by the power plants and those whose livelihoods are dependent on the coal value chain will be significant, activities under Component C is expected to mitigate these risks while creating alternate livelihood opportunities, especially in the renewable energy sector and reducing coal dependency.

28. The final list of indicators will be available during the project preparation stage. Anticipated outcomes of the project include the following:

- a. Decommissioned coal-based power generation capacity (MW)
- b. Net greenhouse gas emissions (GHG) emissions (metric tons/year)
- c. Generation capacity of energy constructed or rehabilitated (megawatt) - Solar, wind, energy storage
- d. Eskom workers retrained/redeployed/compensated (percentage, female, male)
- e. Number of suppliers, contractors and enterprises supported (percentage, female-led)
- f. Financing mobilized, including from MDBs and other parties (broken down by government and other sources)

⁸⁹ This is only a preliminary estimation of the expected GHG emission reduction with excessively simplified assumptions. A detailed analysis on the expected GHG emission reduction from decommissioning of the CFPPs involving a power system level analysis will be conducted at the project development stage through consultations with Eskom.

A.5.1.8. Timeline

29. The project timeline for CFPP decommissioning and CFPP site repurposing will be in line with Eskom’s CPP retirement schedule as follows:

Table A. 5 Retirement Schedule of the Three Eskom Coal Power Generation Units

CPP	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10
Camden	Jul’23	Jan’23	Jan’24	Apr’25	Nov’25	Aug’24	Nov’24	Jul’25	N/A	N/A
Hendrina	-	Feb’25	-	Mar’25	Dec’25	Sep’25	Mar’24	-	-	Mar’23
Grootvlei	Aug’26	Mar’26	Sep’27	-	-	-	N/A	N/A	N/A	N/A

30. It is expected that the private sector coal-based generation capacity replacement projects will be submitted for the Trust Fund Committee review in late 2023 and IFC Board approval of the individual sub-projects will follow in 12-18 months after that.

A.5.2. Project 2 – Mpumalanga Community Development Project

A.5.2.1. Background

31. Accelerating coal transition and the retirement of coal plants is expected significantly impact employment and livelihoods in Mpumalanga Province, particularly in the Highveld region. 76% of South Africa’s total coal-related employment is concentrated in just four municipalities in Mpumalanga, namely eMalahleni, Steve Tshwete, Msukaligwa (formerly Ermelo) and Govan Mbeki, which have highly undiversified economies that rely heavily on the coal economy and where coal mining accounts for 26%, 17%, 14% and 11% of total employment respectively.

32. Many of the communities living in concentrated coal areas are not only dependent on the mines, Eskom or Sasol for their jobs but some are also provided basic services including electricity, water and health services by these entities rather than by their municipalities. As towns have grown due to immigration, local governments have not been able to keep pace with providing basic needs for the growing population, especially those living in informal settlements where many residents remain without access to electricity, water and sanitation or the means to pay for them. Projected backlogs for 2021 stood at close to 40,000 households without access to water, 70,000 without access to electricity, and 67,000 households without sanitation. Reduction in local revenues of local governments due to the closure of the coal mines and power plants will further limit their capacity to fund public services. The shift away from coal activities will present complex social challenges as it will particularly impact the traditionally marginalized and excluded groups, increasing the likelihood of social tensions both within households and communities.

33. This makes it imperative for the province and municipalities to plan for both mitigating the negative impacts of the planned transition as well as invest in future green economy jobs and the human capital needed for such jobs and opportunities by strengthening participatory planning and collective action by communities and local governments. This is a key principle of just transitions recognized in the

provincial as well as national government's just transition policy and planning documents.⁹⁰ Accordingly, the transformation should include opportunities for communities, local businesses, labor unions, local governments, provincial authorities and other relevant stakeholders to participate in and invest in the new opportunities in the wake of the transition in the green sectors, including agriculture and forestry.

34. Adopting the principles of community driven development have been found to be successfully leveraged both in the context of South Africa as well as in just transition processes elsewhere around the world.⁹¹ A community driven process also aligns with recommendations of climate change thought leaders on the utility of such a process enabling South Africa to lead a just coal to clean transition that South Africa can model for the world.⁹² Prior assessments on understanding the challenges to the transition process in Mpumalanga as well as South Africa renewable energy procurement program identify the need for improving bottom up stakeholder engagement to ensure inclusive outcomes and buy-in.⁹³ In fact, examples from other countries of industrial transition processes show that unless an increased focus on the role of communities is placed in the transition process, it can have critical impacts on the social and economic fabric of communities starting a vicious spiral where a declining tax revenues means less funding for basic services, more employers and workers moving away and fewer and fewer jobs. Reversing this cycle and revitalizing communities takes sustained efforts.⁹⁴ There are several examples of where a sustained community driven approach has been used to ensure a critical outcome of a just transition process, i.e. social acceptance and stakeholder empowerment. Case studies include the coal decommissioning processes in the United States,⁹⁵ Denmark's wind sector, Port Augusta in Australia (closure of two coal fired power stations)⁹⁶ amongst others, which provide lessons and evidence of the need for a community driven process to ensure effective bottom up social dialogue to ensuring good retraining and deployment of employees, creation of new jobs in renewable energy including ensuring benefits to surrounding communities indirectly affected by transition processes.⁹⁷

⁹⁰ For example see The Mpumalanga Vision 2030, Mpumalanga Department Of Economic Development And Tourism Strategic Development Plan 2020-2025 and the PCC's Framework For A Just transition in South Africa Report 2022.

⁹¹ <https://www.3ieimpact.org/evidence-hub/publications/working-papers/community-driven-development-does-it-build-social-cohesion>

⁹² Gompertz, D. (2022, January 13). Coal in 2022: South Africa's Just Energy Transition Partnership. E3G. <https://www.e3g.org/news/coal-in-2022-south-africa-s-just-energy-transition-partnership/>

⁹³ <https://justtransitioninitiative.org/understanding-just-transitions-in-coal-dependent-communities/>; A review of the local community development requirements in South Africa's renewable energy procurement programme, 2015 TECHNICAL REPORT ZA

http://awsassets.wwf.org.za/downloads/local_community_development_report_20150618.pdf

⁹⁴ <https://www.oecd.org/env/cc/g20-climate/collapsecontents/Just-Transition-Centre-report-just-transition.pdf>

⁹⁵ Coal-dependent Communities in Transition Identifying Best Practices to Ensure Equitable Outcomes, https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-31909.pdf; Tarekegne B.W., K. Kazimierczuk, and R.S. O'Neil. 2021.

⁹⁶ <https://www.oecd.org/env/cc/g20-climate/collapsecontents/Just-Transition-Centre-report-just-transition.pdf>

⁹⁷ https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-31909.pdf;

<https://www.oecd.org/env/cc/g20-climate/collapsecontents/Just-Transition-Centre-report-just-transition.pdf>;

Tarekegne, B., Kazimierczuk, K. & O'Neil, R. Communities in energy transition: exploring best practices and decision support tools to provide equitable outcomes. *Discov Sustain* 3, 12 (2022). <https://doi.org/10.1007/s43621-022-00080-z>; https://energy.ec.europa.eu/system/files/2021-05/good_practice_examples_of_regional_and_sub-regional_strategies_in_coal_regions_in_transition_0.pdf

A.5.2.2. Project Objective

35. The project objective is to support local communities and the provincial and local governments in Mpumalanga province during coal transition and prepare for new green economy for the future. This will be achieved by increasing the quality of, and access to, energy, social and economic infrastructure services; strengthening local governance mechanisms for creating an enabling environment to facilitate investments in sustainable, green and resilient growth; and empowering local communities to become more resilient to the impacts of the transition through the creation of new jobs and livelihoods opportunities.

A.5.2.3. Proposed Approach

36. The IP envisages two levels at which community benefits are generated for this project, namely (i) Mpumalanga's Green Cluster model and (ii) community-level development initiative.

37. **Mpumalanga's Green Cluster model:** The Mpumalanga provincial government has recognized that transition from coal is inevitable over time and has been proactive in exploring opportunities to stimulate investments in alternative and green economy-led growth to facilitate the transition process. This opportunity, championed by the Mpumalanga Department of Environment and Economic Development, seeks to smoothen the inevitable economic transition and includes a host of potential initiatives, including, for example, the opportunities presented by repurposing land on coal plants and mines that will ultimately be decommissioned. In collaboration with GreenCape, and supported by the UK's PACT, the region has prioritized a cluster development model by creating the Mpumalanga Green Cluster Agency, to build a modern green economy in partnership with government, business, and academia to unlock new investment opportunities across various sectors.

38. Registered as a not-for-profit organization, the Mpumalanga Green Cluster Agency was established with the vision of working at both the micro and macro levels to support green-tech SMEs build their businesses, enabling bigger businesses to improve their environmental footprint, and assisting the provincial government to create an enabling environment to facilitate more investment to create shared value for sustainable and resilient economy that creates decent and sustainable green jobs.

39. **Community-Driven Development (CDD):** The focus of this proposed initiative is to support the just transition agenda in South Africa by sustainably enhancing the access of local communities to improved social and economic infrastructure services and strengthening the capacity of provincial and local government to effectively transition to green economy. The rationale for adopting a CDD approach to achieve these objectives are to ensure that: (i) local communities, including youth, women and marginalized groups, are actively engaged in selecting transition-focused initiatives; (ii) investments in social and economic infrastructure (including those relating to the green economy) attend to the needs and priorities of local communities in an inclusive manner; and (iii) all members of the target communities are provided with the information, facilitation and capacity building necessary to make decisions that are needs-based and inclusive of women, vulnerable, and poor households.

40. The initiative could include both public and private sector elements and will include the following components:

41. Component A: Community Mobilization and Capacity Building: Enabling local communities alongside local government mechanisms to take part in decision-making processes over local investments in social and economic infrastructure and income generating activities, will be key to ensuring that people

are at the center of the decision-making processes. Proportionate representation of local communities in decision and implementation processes, with active participation of women and youth, would also be critical to ensuring equitable outcomes of a just transition process. Further, more information dissemination, education, and awareness on the effects of climate change and energy transition are also needed to foster meaningful engagement. The community mobilization and capacity building activities will involve adopting approaches to first bring together communities, including women and unemployed youth, by addressing barriers that limit participation, providing the necessary information in a simplified form and supporting them in assessing the information, opportunities and options that are presented to them.

42. Accordingly, the project will support: (i) establishment of community development councils or revitalization of existing community organizations to facilitate community participation and oversight in the development process relating to coal transition; (ii) community mobilization and capacity building activities to enable local communities to take part in decision-making process over local investments in social and economic infrastructure in an informed and cohesive manner (e.g., technical assistance and capacity development support to strengthen the ability of community development councils/community organizations to identify, plan and implement community sub-projects); (iii) establishment of community governance, social accountability, and conflict resolution systems; (iv) registration of these community councils/or community organizations with the provincial government to provide them with the status to serve as a partner of the provincial government.

43. Component B: Strengthening Governance Mechanisms and Institutional Capacity: The objective of this component is to support the governance mechanisms and capacity development of provincial, municipal and local government authorities in Mpumalanga province. Given the scale of the transition and the wide-ranging impacts on communities, strong and increased levels of coordination among social partners with clear roles and responsibilities and accountability framework is required to avoid fragmentation and social tensions as well as maximize opportunities from the transitions process.

44. Under this subcomponent, resources will be committed to developing a comprehensive just transition plan for the province and participating municipalities that focus on green growth strategies, alternate economic opportunities, poverty reduction and social protection related policies and programmes. This subcomponent will also support focused analytical studies, reviews of current practices, international experience sharing, stakeholder dialogue and dissemination, with an emphasis on meaningful engagement with the community councils/organizations discussed under Component A. It is expected that these activities will pave the way for the establishment of participatory planning processes, management information and monitoring and evaluation (M&E) systems (including impact evaluation); partnerships development; and transparent and effective feedback mechanisms to support the transition process. Further, it will also seek to advance social accountability mechanisms, including community-based monitoring, community scorecards, and social audits, to ensure community oversight, transparency and accountability of investments.

45. Component C: Investments in Community Infrastructure Schemes and Income-Generating Opportunities in the Green Sector: This sub-component will include investment grants to support local development schemes, entrepreneurial initiatives, and activities that respond to community priorities identified through participatory processes followed under Component A and Component B. The identification, design and implementation of these activities will be based on community needs and provincial and local government's priorities and will be carried out in consultation with local and provincial governments, community organizations and representatives, civil society, academia and economic

development agencies in the Mpumalanga region. It is expected that the project will provide useful experience to test different approaches to scale additional JET interventions, including private sector investment while also establishing process legitimacy for the sustainable retirement of coal-fired power plants and how to ensure equitable outcomes in the transition process.

46. Activities financed could include those that will increase access to basic social services, enhance the economic infrastructure, support income-generation through existing SMMEs and start-ups, promote social cohesion and strengthen local governance and capacity in relation to the transition process. All subprojects will be reviewed by the Provincial/municipality governments to ensure that the schemes financed are consistent with local development plans, particularly as they relate to the impacts of the transition process and will be documented in public records. The investments could also include private sector infrastructure investments focused on promoting clean energy generation and supply chains, with examples including expanding energy efficiency, rooftop and community solar as well as solar irrigation. The selection of the investments will also seek to finance local community projects that prioritize the needs of women, youth and other vulnerable groups, and empower them in the area of implementation of the projects (e.g., initiatives that facilitate energy access for female-headed households, including development of energy services, afforestation and smart-agriculture initiatives).

A.5.2.4. Implementation Readiness

47. With increasing recognition that the success of South Africa's transition process is closely tied to Mpumalanga's capacity to mitigate the adverse impacts as well as benefit from coal transition, the interest in supporting the provincial and local governments, have burgeoned recently. The ability to optimize this varied support requires having in place a strategic framework for regional development, relevant capacity and provincial and local government level, institutional mechanisms for coordination, basic infrastructure and facilities needed for private sector growth, entrepreneurial capacity and skills to utilize opportunities of green growth, an informed citizenry able to participate in decision-making and contribute to the development process. This comprehensive support provided through this project, will help create an enabling environment for the successful closure of power plants, the coal mines as well as green growth. Critical factors indicating implementation readiness include:

- a. National and provincial commitments, including frameworks, policies and strategies to put people at the centre of the transition process;
- b. Institutional mechanisms within Mpumalanga province like the Green Cluster Agency; the proposed two-level governance structure for stakeholder engagement, namely the Mpumalanga Just Transition and Climate Change Forum, a multi stakeholder coordinating forum, and a Technical Working Group/Technical Coordinating Committee ancillary to and in support of the Forum;
- c. MoU signed between Eskom and the Mpumalanga province to partner on the JET strategy as well as the closure of Eskom's first coal-fired power plant in Komati (financed by the World Bank) currently under preparation;
- d. Request from the provincial government to the World Bank for support in implementing its just transition strategy, including capacity development of provincial and local government institutions, improving access to energy, social and economic infrastructure services, and enhancing stakeholder engagement, in coordination with the Presidential Climate Commission;
- e. Successful cases of community driven development activities in South Africa, especially from

KwaZulu Natal and the Western Cape,⁹⁸ that can be replicated in the context of Mpumalanga as well.

A.5.2.5. Rationale for CTF ACT financing

48. With high rates of unemployment, large number of people living on the margins, and an economy that is highly dependent on the coal value chain for income and livelihoods, the Just Transition agenda in Mpumalanga, and by extension, South Africa, requires multi-sectoral interventions that hinges on inclusive and participatory planning and decision-making. Managing and easing the social and economic transition will also need to attract investment to transform the regional economy to a new green future. This creates a case for support to both public and private sectors to create an enabling environment for investment and together to catalyze new economic opportunities. Grants and risk financing will provide the flexibility to support programs through Eskom (at and around their former coal plants), for the Green Cluster Agency through their public and private programs and for the CDD-led community programs. It will also create a model for such partnerships for future transition and offer lessons that can be incorporated over time into this and other related JET programs.

A.5.2.6. Results Indicators

49. Anticipated outcomes of the project include the following:

- a. Improved capacity of provincial and municipal governments to implement relevant just transition strategies
- b. Improved access of local communities to municipal services (e.g., water, electricity, etc)
- c. Effective community infrastructure schemes and income-generating activities in the green sector, especially with the participation of women, youth and other vulnerable groups
- d. Share of women in decision-making forums/platforms related to just transition
- e. Enhanced collaboration/partnerships between local communities, private sector, civil society and provincial/local governments on transition process.

A.5.2.7. Timeline

50. The timeline for the project will be developed once approval is obtained for the proposed IP program.

⁹⁸ Sustainable Community Development in South Africa , <https://www.globalnature.org/en/community-development-south-africa>; <https://www.saferspaces.org.za/organisation/entry/arise-community-development-projects>; <https://www.saferspaces.org.za/organisation/entry/arise-community-development-projects>; Community-driven development: does it build social cohesion or infrastructure? A mixed-method evidence synthesis, <https://www.3ieimpact.org/evidence-hub/publications/working-papers/community-driven-development-does-it-build-social-cohesion>.
<https://www.e3g.org/news/coal-in-2022-south-africa-s-just-energy-transition-partnership/>

A.5.3. Project 3 – Energy Efficiency, Distributed Generation and Community Generation Programs

A.5.3.1. Background

51. At a national level, the potential contribution of energy efficiency projects to the South Africa's transition to a low carbon economy is recognised in the National Development Plan, the draft National Energy Efficiency Strategy and in the Climate Change Policy White Paper through its flagship projects. The Energy Efficiency and Energy Demand Side Management (EEDSM) flagship, aims to support the development and implementation of an aggressive programme of energy efficiency in industry, the residential sector, and the government building sector.

52. Fostering distributed generation, defined as smaller RE systems connected to the grid at distribution level (in the case of electricity) has many benefits. When comparing larger grid-tied solar PV plants with roof-top solar it is found that job creation of the latter is significantly higher. South Africa's grid is in many places constrained limiting the short-to-medium prospects of large-scale VRE plants. Distributed generation when supported by feed-in tariffs or the like allows utilities to leverage private capital for additional incremental generation capacity. Eskom is working on its own distributed generation business case and some municipalities are doing the same.

53. However, not all people, businesses, and entities (public and private) have access to land and/or rooftops suitable for distributed generation. Moreover, the minimum cost ("entry ticket") for distributed generation systems runs into tens of thousands of Rands. Thus, based on international experience fractional ownership of distributed generation plants with the fractions potentially being tradeable offer of a way for poorer segments to engage in and experience ownership of renewable energy generation assets. Furthermore, with wheeling clearly being part of South Africa's path towards much higher use of renewable energy fractional ownership will not be restricted to specific locations. On the hand fractional ownership of RE generation assets can be offered – at market or reduced prices - to impacted members of the public as an enabling policy to reduce opposition to projects and fractional ownership can also be employed as a national "Just" policy giving every citizen a stake in the country's generation fleet.

54. Energy efficiency, distributed generation and community generation programs will be initiated in the province of Mpumalanga.

55. There have been a number of successes regarding energy efficiency in the country, including the section 12L, of the SA tax code providing an income tax allowance for energy efficiency investments and the DMRE EEDSM programme. However, it is recognised that there is still an enormous potential for further energy efficiency improvements in the South Africa economy. Tariff increases are often a key driver underpinning the development of energy efficiency projects; however, despite significant increases over the past decade few projects are implemented. There are several reasons for this including, but not limited to: limited understanding of energy efficiency projects in the financial sector; lack of expertise in both the private and public sectors on how to identify, commission and implement such projects; and the inability of providers of energy efficiency services, and private sector companies, to access finance for these types of projects. Cumulatively, these barriers result in the lack of a pipeline for the development of energy efficiency projects through identification, design, development, financing, and successful implementation.

56. The EEPBIP funded by the NAMA facility and presently being implemented by the DMRE, with GIZ support, offers a ready-made solution to this problem.

57. Its focus is on energy efficiency in public sector buildings and infrastructure (e.g., municipal wastewater treatment plants, street lighting). It aims to develop a pipeline of bankable projects, mobilising private sector providers of energy services (including ESCOs) to finance and deliver such projects in partnership with public sector entities.

A.5.3.1. Proposed Approach

58. The project comprises the following three components:

- a. Component A: Energy efficiency
- b. Component B: Distributed generation
- c. Component C: Community generation

59. The proposed approach towards Component A is to develop a Mpumalanga focussed programme of the EEPBIP, to specifically drive the development and implementation of energy efficiency projects in the province. The support includes but is not limited to:

- a. undertaking energy audits;
- b. identifying and developing business plans for potential energy efficiency projects;
- c. developing standardised procurement and energy performance contracting procedures; and
- d. associated capacity-building activities in the public and private (including financial) sectors.

60. The financial component involves the creation of a Partial Credit Guarantee (PCG) to mitigate risks (e.g., non-payment or payment delays) of private sector companies contracting with public sector institutions for such projects. The objective of the PCG (to be implemented by the Industrial Development Corporation) is to increase the appetite of financial institutions to get involved in such projects, by addressing project related risks. In terms of the financial component, as an additional element for this proposal, it is also proposed that funding be made available to seed an energy efficiency credit line for Mpumalanga based projects to further support pipeline development. This is to be located at a South African based financial institution, which would be identified in the project preparation phase. As mentioned previously the fact that this proposed initiative is leveraging on an existing programme infers a high state of implementation readiness.

61. This initiative is relevant in terms of the ACT program, not only in terms of the reductions in the use of grid-based electricity and their associated GHG emissions, but also in terms of the social and economic development aspects. Implementing a pipeline at scale will lead to several positive socio-economic impacts that will contribute towards mitigating negative impacts associated with the transition from coal. These include:

- a. Job creation in the energy services sector because of an increased pipeline of projects in Mpumalanga. With an increased long-term demand for services provided by energy services companies, they would be encouraged to set up a presence, with associated permanent jobs in Mpumalanga Province. In addition, the public sector pipeline this initiative will develop will provide a baseload of work that can leverage further private sector opportunities. The province has a number of energy intensive sectors (e.g., mining, paper and pulp, sugar milling) that are a potential source of such opportunities,

in addition to a broad base of SMME activities. This diversification of the sources of projects would support the sustainability of these companies supporting long-term and localised employment benefits.

- b. The development of an energy services sector would also create opportunities for new skills development for workers in Mpumalanga.
- c. Retention of existing jobs is and will be important in Mpumalanga and this initiative should assist in supporting the resilience of existing companies. This is through the development of an active energy services sector in Mpumalanga which will be looking for opportunities to support companies in reducing their exposure to energy related costs. The SMME sector is particularly vulnerable to increasing energy prices in South Africa, whether it be liquid fuels or electricity related. Any reductions in these costs will assist companies to retain staff and lessen their impact on their growth strategies. In addition, reducing energy use further opens opportunities to address the energy security challenge South Africa businesses face, whether it be by storage and/or own generation. This reduced energy use reduces the scale, and therefore the costs, associated with such interventions.
- d. The proposed initiative is aligned with the strategic aims of the ACT and in addition will support systemic change and adaptive sustainability. This is a result of building a system that will enable a long-term pipeline of energy efficiency projects to be developed, as it is linked to the public sector which, as a permanent element of Mpumalanga's economy, will support the sustainability objective of the project. The project management unit envisaged will also enable the initiative to be responsive to any changes in the context it operates in, as well as ensuring issues such as social inclusion and gender are reflected effectively and comprehensively in the initiative's operational approaches and any projects developed through its work.

62. Component B structures will be created to support and foster private and public investments in distributed generation system, initially in the province of Mpumalanga, with the explicit ambition that the Component will help in the transition away from fossil fuels and help address the supply crisis in the country. In terms of technology the programme will be neutral with the provision that roof-top solar PV will have a dominant role at least at the beginning.

63. Component C will adopt the following approach. South Africa already has at least one entity that offers fractional ownership of roof-top solar PV installations, but with a model that entails PPAs and monetary returns to fractional owners. While this model is with merits the Community Generation Programme initially centred in the province of Mpumalanga will also seek to foster citizen focused models in which kilowatt hours produced are credited fractional owners' electricity bills. Furthermore, the model can be expanded to include communal or trust-owned systems that, for instance, ensure common goods such as streetlights operating in an area. A key strength of a community generation approach is that it easily lends itself to hybrid ownership structures. It also lends itself to cash-starved entities developing large rooftops or land unsuitable for habitation or productive uses (e.g., retired rubbish dumps and areas along railway lines) by using a communal ownership model in return for a share in kilowatts produced.

A.5.3.2. Implementation Readiness

64. Currently, the ACT participating MDBs, including AfDB and the World Bank, are discussing the implementation modalities with the country counterpart and international development partners.

65. The EEPBIP is a programme in implementation that is available to address some of the main challenges of energy efficiency project development. It does this through two components - technical and financial. The technical component uses an Energy Efficiency Support and Project Management Unit to plan, manage and implement projects in the public sector.

66. In addition, there are existing initiatives in place that will allow it to scale up quickly and specifically identify potential project developers. These initiatives include:

- a. SANEDI’s programme to implement Energy Performance Certificates in buildings.
- b. SANEDI’s ongoing work supporting ESCO development in the country.
- c. Mpumalanga Province’s initiative to develop a Mpumalanga Green Economy Cluster in the province to support Just Transition related activities.

67. Distributed generation is a proven approach in terms of technical viability backed rapid developments inverters which means that such systems can be grid forming (support grid stability). Eskom and municipalities have staff that can with support apply models developed in other markets to the circumstances in South Africa.

68. While there are significant overseas experiences in community generation and South African expertise are emerging, Component C will initially require dedicated support both in terms of financing and TA.

A.5.3.3. Rationale for CTF ACT financing

69. The ACT’s focus on regions and communities that are being affected by the transition away from coal is the underlying rationale for financing this component. It will be focussed on South Africa’s coal regions, starting with Mpumalanga Province, which is the region that will experience the most significant socio-economic impacts because of the move away from coal. To support this project effectively, a mixture of technical assistance for project development, as well as the mobilisation of financing to support the implementation of developed projects will be required. This fits the support mechanisms being offered by the ACT. In addition, the focus will not only be on reducing GHG emissions, but also looking at the creation of economic opportunities for the communities and workers in Mpumalanga and other coal regions and elsewhere affected by the transition.

A.5.3.4. Indicative Financing

70. An indicative financing plan is as follows:

Table A. 6 Energy Efficiency, Distributed Generation and Community Generation Programs

Project Component	ACT funding allocation	MDB funding allocation
Component A: Energy efficiency	USD 40 million	USD 10 million
Component B: Distributed generation	USD 5 million	USD 20 million
Component C: Community generation	USD 5 million	USD 20 million
Total	USD 50 million	USD 50 million

71. Component B and Component C are expected to have a high degree of leveraging of private capital in the form of utilization of private savings and ability to borrow from the financial sector. For the province

of Mpumalanga, it is estimated that ACT funding of 5 million USD for each in combination with MDB financing of 20 million for each will have a significant catalytic effect.

A.5.3.5. Results Indicators

72. The scale and associated impact of the intervention under Component A is expected to be significant, although it would need to be confirmed in a project preparation phase. In terms of verified energy savings, a rough estimate from the EEPBIP's work nationally gives a conservative figure of 145 GWh of, possible, electricity savings per year in Mpumalanga province only. In terms of GHG impact this is equivalent to an emission reduction of 153 700 tonnes of carbon dioxide equivalent per year. The following results indicators are proposed for the project results log frame:

- a. Verified energy savings in kWh or GJ (the energy savings will not only be in electricity);
- b. GHG emission reductions associated with the verified energy savings (in tonnes of carbon dioxide equivalent); and
- c. indicators to measure the economic opportunities created and any associated social beneficial impacts.

73. Component B and Component C will facilitate a high degree of citizen involvement in solving the country's energy crisis, make use of private investments for the transition away from fossil fuels and expand local opportunities for skilled job's creation. By its very nature, the community generation approach involves engagement at local levels both potentially uplifting poorer areas and individuals and creating buy-in to the notion of transitioning from fossil fuels. Smaller localized projects would like the distributed generation projects described above generate jobs and develop skills in local areas, which could be area directly affected closure of coal mines and/or coal fired power stations. The proposed results indicators include:

- a. Verified energy production in kWh;
- b. GHG emission reductions associated with the verified energy production (in tonnes of carbon dioxide equivalent assuming substitution of coal); and
- c. indicators to measure the economic opportunities created and any associated social beneficial impacts.

A.5.3.6. Timeline

74. The timeline for the project will be developed once approval is obtained for the proposed IP program.