

**PROJECT INFORMATION DOCUMENT (PID)  
APPRAISAL STAGE**

Report No.: AB5486

<b>Project Name</b>	Eskom Power Investment Support Project
<b>Region</b>	AFRICA
<b>Sector</b>	Power (100%)
<b>Project ID</b>	P116410
<b>Borrower(s)</b>	Eskom Holdings
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<b>Implementing Agency</b>	Eskom Holdings
<b>Environment Category</b>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> FI <input type="checkbox"/> TBD (to be determined)
<b>Date PID Prepared</b>	February 8, 2010
<b>Estimated Date of Appraisal Authorization</b>	January 22, 2010
<b>Estimated Date of Board Approval</b>	March 30, 2010

**I. Key development issues and rationale for Bank involvement**

1. **South Africa is Africa's largest economy and the country is a regional economic powerhouse.** Robust growth of the South African economy has proved instrumental in improving conditions in the Sub-Saharan Africa (SSA) region as a whole. The South African economy has gone from strength to strength since the early 1990s. As a result, South Africa's GDP in 2008 was 42 percent higher than its level in 1999, and 62 percent higher than in 1994. This robust growth took the country's per-capita GDP to just under US\$6,000 in 2008, at par with Argentina, Brazil, and Malaysia, consolidating its position in the ranks of the world's Upper Middle-Income Countries (UMICs).

2. **South Africa's economic achievements have spread well beyond its borders to the rest of Sub-Saharan Africa.** South Africa accounts for nearly one-third of SSA's GDP, and two-thirds of southern Africa's GDP. Studies have shown that a one-percent growth of South Africa's GDP is associated with a 0.4-0.9 percent growth in the GDP of the rest of sub-Saharan Africa, independent of common shocks. South Africa also dominates the regional electricity market through Eskom, its state-owned utility company, which generates 95 percent of electricity used in the country, and more than 60 percent of all electricity produced in SSA.

3. **The ongoing global economic crisis has taken a heavy toll on the South African economy.** The economy has slipped into a recession for the first time in 17 years, and its GDP contracted by 3% in the second quarter of 2009, following earlier contractions of 6.4% in the first quarter of 2009 and 1.8% in the fourth quarter of 2008. The Government's main objective is to return to a path of accelerated, shared growth, reduce unemployment and poverty within a reasonable time frame, and ensure a stable sustainable macroeconomic framework.

4. **South Africa is a dual economy with one of the highest inequality rates in the world. A large proportion of the population is poor and coexists with the "first-world" lifestyle of a segment**

**of the multi-racial population.** The social structures of apartheid have proven long-lasting, even though their legal foundations are no longer in place. Post apartheid governments have provided electricity, schooling, and health facilities to many more people; however an intensified effort to address the inequalities of the past is required. Pockets of poverty remain deeply entrenched mostly among the black population. Denied the opportunity under the old regime to accumulate capital in any form – be it land, financial, skills, education, or social networks so necessary for enterprise – many are finding it difficult to break through the dual and segmented structure of the economy. The capital and energy intensive nature of the economy has made progress on job creation, the easiest pathway for broadening economic participation, vastly insufficient, and self-employment has been hampered not only by the lack of capital and more recently energy, but also the vast spatial barriers erected by the geography of apartheid.

5. **Efforts to reduce the more than 24 percent unemployment rate and to expand the resource base of the government for pro-poor expenditure suffered a first setback in late 2007/early 2008, when emergence of power shortages posed a serious risk to economic growth and poverty reduction objectives.** Soon after, the global economic crisis started to further jeopardize past progress and cut into resources available to the government. Thus far, the government has done well in containing the damage from the global crisis. However, reemergence of the energy crisis can easily become the biggest bottleneck to the country's economic recovery once the global situation turns around. Impending shortage of electricity in an economic recovery scenario will result in unemployment (e.g. mining and industry), much slower than anticipated job creation due to slow growth, and stifle emergence of Small and Medium Enterprises (SMEs), thus resulting in a narrowing of economic participation for the previously excluded. It is therefore critical that South Africa find an immediate resolution to the impending energy crisis. To this end Development Finance Institutions' support for Eskom is seen as crucial to ensure success in a markedly changed global financial environment.

6. **Availability of surplus power supply has been essential to propelling South Africa's energy-intensive economy.** Electricity consumption increased by about 60 percent between 1994-2006 as a result of a 50 percent increase in real GDP, South Africa's mass electrification expansion program, rapid urbanization and industrial growth. Residential consumption of electricity, 20 percent of total consumption, grew by 50 percent, as access to electricity multiplied and rising income levels and urbanization saw greater use of electricity in people's lives. The pressure of expanding demand on the power sector has been especially severe for South Africa because of the energy-intensive nature of its economy.

7. **The strong growth in electricity demand was not matched on the supply side.** No new greenfield generation capacity in either private or public sector has come on-stream between 2001-2006. Peak demand caught up rapidly with the country's generation capacity, and in late 2007, Eskom's reserve margins fell to dangerously low levels leading to an electricity crisis with attendant large economic losses.

8. **Electricity shortfalls in South Africa also hinder the economic development of the region, which depends on South Africa for its electricity supply.** Several of South Africa's neighbors, such as Botswana, Lesotho, Namibia, Swaziland, and Zimbabwe have long depended on Eskom-generated electricity supply.

9. **The electricity crisis of 2007/08 reinforced the need for urgent implementation of Eskom's Investment Program.** The Government of South Africa has responded with a two-pronged approach by: (i) assigning the highest priority in the near-term to improving generation capacity, and (ii) adopting strategies to accelerate energy efficiency, investing in clean energy, and pursuing regulatory and economic instruments to stabilize greenhouse gas emissions over the medium-term, and eventually reduce emissions over the long-term, as envisaged in the government's Long Term Mitigation Scenarios (LTMS). The LTMS recommends five priority climate change mitigation options in South Africa: industrial energy efficiency, renewable energy, nuclear power, modal shift in passenger transport, and improved vehicle efficiency.

10. **The GoSA's near-term policy response focuses on four areas:** (i) increasing supply capacity by bringing on new short-term, high-cost capacity, re-commissioning old plants that have been taken out of service and financing an aggressive new build program for Eskom with significant addition to generation capacity; (ii) improving Eskom's operating practices to increase supply-side reliability; (iii) accelerating an energy efficiency program which targets low-cost high-impact interventions including solar water heaters, compact fluorescent lamps (CFLs) and demand-side management options; and (iv) designing a legal and regulatory framework to attract private sector investment in generation with a focus on renewable energy.

11. **GoSA's policy response reflects the fact that there are no immediate domestic alternatives to coal for supplying large amounts of electricity in South Africa.** Coal will continue to be a major, low-cost source for power-generation during the next 10-15 years. Coal is abundantly available in South Africa for large-scale power generation, especially considering the scale of the country's unmet energy needs estimated to be 12,000 MW over the next 5-7 years. South Africa is the world's fifth largest producer of coal; extraction costs of this high quality and low sulfur coal are low. The country has insignificant deposits of oil or natural gas. The greatest potential for large renewable projects is limited to concentrated solar power (CSP) and wind energy. However, CSP technology is still in early stages of development and cannot be relied on for the country's large base load needs. Although wind energy is a commercially mature and proven renewable energy technology, it is not well-suited to meet the large base load requirements such as those faced by South Africa. New hydropower potential is largely non-existent.

12. **There are also no feasible near-term regional renewable alternatives in the sub-region to meet the demand in South Africa.** There is a severe shortage of generation capacity in the sub-region. Nine of the 12 countries in the Southern Africa Power Pool (SAPP) have been experiencing energy shortages, caused primarily by the shortfall in South Africa's generation capacity. Large renewable generation capacity does exist within the SAPP but cannot be mobilized in the near-term and certainly not soon enough to mitigate the impending power crisis in South Africa. Moreover, the current generation requirement is larger than the combined undeveloped hydro generation potential of Zambia and Mozambique, countries with the most feasible sources of regional supply in the near-term, and much larger than all generation projects deemed feasible within SAPP over the medium term.

13. **GoSA has determined that national sustainable development goals and global climate change necessitate South Africa's transition to a low-carbon economy.** The Cabinet endorsed the LTMS, which envisages a shift away from coal toward nuclear and renewable energy, with a view to ensuring that the carbon emissions from all sources, including electricity generation, peak during 2020-2025, plateau for a decade, and then begin declining thereafter.

14. **Demand Side Management (DSM) will in addition play a key role in minimizing the inefficient use of energy,** which, over the years, has made the South African economy one of the world's most energy-intensive. In order to moderate the demand growth, Eskom together with the GoSA and the National Energy Regulator of South Africa have embarked on a DSM program aimed to save 3,000 MW of generation capacity by 2013, equivalent to the size of a large generation plant. The program aims to further save an additional 5,000 MW of generation capacity by 2025. Mitigation strategies through a combination of penalties and incentives to promote greater energy efficiency have appropriately become an integral part of the GoSA's plans. And recognizing that it cannot rely on public sector alone for DSM activities, GoSA has sought to strengthen the sector's policy framework to attract private investment.

15. **GoSA has adopted a proactive policy approach to close the supply-demand imbalances in a responsible manner.** A string of policy actions in recent months demonstrates the Government's commitment to addressing the sector's supply woes in a socially and environmentally responsible manner. Major actions include:

- (a) Ensuring financial viability of the electricity sector, through the issuance of the Electricity Pricing Policy (EPP) in December 2008.
- (b) Improving domestic and regional electricity supply security through enactment of legislation that would help ensure a safe generation reserve margin, generate private sector interest in bidding for power generation capacity, and lock-in off-take electricity purchase agreements with power producers in neighboring countries.
- (c) Supporting the poor by implementing the relevant provisions of the EPP.
- (d) Promoting energy efficiency.

16. **A number of other recent national and international commitments have signaled GoSA's commitment to pursuing a low-carbon growth trajectory.** The major actions include: (a) Ratification of the United Nations Framework Convention on Climate Change (UNFCCC) in August 1997, and accession to the Kyoto Protocol in July 2002; (b) Adoption of a National Climate Change Response Strategy (2004), which outlined a broad range of principles and policy measures of mitigation and adaptation to climate change; (c) Adoption of the Copenhagen Accord of 2009, which has committed South Africa to implement economy-wide emission targets for 2020; (d) Issuance of the Electricity Regulations for Energy Efficiency; (e) Adoption of a National Energy Efficiency Strategy (2006), which set an ambitious national target for energy efficiency improvement of 12 percent by the year 2015. In April 2006, a National Energy Efficiency Agency (NEEA) was established with the mandate to promote energy conservation; and (f) Adoption of a 2005 White Paper on Renewable Energy, and setting a target for achieving 4 percent of electricity demand (about 10,000 GWh) from renewable sources by 2013. These provisions are supported by a robust and mandatory system for public disclosure and pro-active stakeholder consultation with respect to environmental and social impacts;

17. **Eskom has embarked on an estimated US\$ 50 Billion Investment Program that includes over 10,000 MW of greenfield generation to be implemented over a five-year period.** This Investment Program has resulted from a robust and integrated resource planning exercises carried out by GoSA and Eskom that investigated a wide range of supply and demand-side technologies and options and concluded that for South Africa use of domestic coal is the only viable fuel supply source for power generation over the medium-term. Specifically, the following key variables, leading to its decision to construct the proposed generation plants have been considered: (i) fuel options (gas, diesel, LNG, coal, pumped hydro and nuclear); (ii) import of power; (iii) renewable energy options; (iv) technology and unit size (system stability, evacuation, and proven technology); and (v) available sites.

18. **The Eskom Investment Program includes two 4,800 MW coal fired power plants, Medupi and Kusile, which are being developed by Eskom using the same proven technologies used in OECD countries to minimize carbon emissions** - the two power plants are the first in Africa to use the more-efficient "supercritical" design. In addition Kusile has been designed to be "CCS-Space ready". These power stations will be the largest dry-cooled power stations in the world, reflecting the acute concerns over water scarcity in South Africa.

19. **GoSA's strategy to move to a low-carbon energy sector will be supported by private sector projects.** Eskom is expected to play a catalyzing role, while GoSA creates an enabling environment which encourages private investment and helps to place the energy sector on a path toward financial viability. GoSA and Eskom will launch South Africa's first commercial utility-scale renewable energy projects with support from the Bank.

## Rationale for Bank Engagement

20. **The proposed project will provide financing to Eskom (guaranteed by the Government of South Africa) at a time when Africa's largest economy faces unfavorable conditions in accessing foreign financing due to the global financial crisis.** Because South Africa's economic achievements have an impact well beyond its borders, this financing will help ensure adequate electricity supply that is critical for sustaining South Africa's and the sub-region's continued economic development. Providing citizens with efficient, affordable, reliable energy is key to achieving sustainable development and reducing poverty. And most importantly, impending shortage of electricity in an economic recovery scenario will result in unemployment (e.g. mining and industry), much slower than anticipated job creation due to slow growth, and stifle emergence of Small and Medium Enterprises (SMEs), thus resulting in lesser than expected benefits for the previously excluded.

21. **Without the proposed project, the direct economic costs to South Africa would be high and risk undermining the progress South Africa has made in connecting households and electrifying the country** (studies show that the cost of the energy crisis in early 2008 was about 0.8% of GDP). Moreover, should Eskom's Investment Program face delays due to the financial crisis, it will reduce the availability of power supply in the sub-region. Furthermore, an unsustainable Eskom will result in delays in developing many of the large-scale regional and renewable projects that are proposed to supply South Africa with electricity on the basis of long-term Power Purchase Agreements (PPAs) thus limiting the availability of renewable energy in the subregion.

22. **The proposed project will also facilitate GoSA's envisaged interventions on climate change mitigation in the energy sector.** It would support GoSA, through IBRD financing and mobilization of other financing, in implementing high-impact elements of the LTMS, which comprises the responsible development of coal-based generation through the application of more efficient technologies, together with the development of low carbon and renewable technologies to achieve the cabinet endorsed low carbon mitigation scenario. The proposed project would thus respond to the country's integrated strategy for meeting its energy security and at the same time pursuing a low carbon path.

23. **World Bank support to South Africa's energy sector will also enable the continued development of legal and regulatory frameworks as well as enhance development of local and regional renewable energy sources through a financially sustainable Eskom that could contribute significantly to improving the country's energy mix over the medium to long term.** The project will thus help increase generation capacity using available resources, and at the same time help further the foundations for a low-carbon growth trajectory, and help achieve national and sub-regional development objectives.

24. **The Bank's support for the proposed project in South Africa would help to meet Africa's increasingly urgent need for energy to support growth and poverty alleviation.** As noted earlier, an electricity shortage in South Africa would extract a heavy economic cost on the rest of the region, and SSA more broadly. The proposed project will be designed to meet the criteria for support under the World Bank's *Africa Action Plan*,<sup>1</sup> and the *2009 Development and Climate Change: A Strategic Framework for the World Bank Group*.<sup>2</sup> The proposed project also responds to the *African Regional Action Plan for MICs* in that the project outcomes would benefit not only South Africa but the entire region.

25. **The Project Development Objective (PDO) is to enable Eskom to enhance its power supply and energy security in an efficient and sustainable manner so as to support both economic growth objectives and South Africa's long-term carbon mitigation strategy.**

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<sup>1</sup> *Meeting the Challenge of Africa's Development: A World Bank Group Action Plan*, World Bank, September 26, 2005

<sup>2</sup> *Development and Climate Change: A Strategic Framework for the World Bank Group: Technical Report* (DCCSF), World Bank Group, 2008.

## Project Description

26. The project comprises three components which will be implemented by Eskom:
- (a) Component A includes the Medupi coal-fired power station (4,800 MW, based on super-critical technology) and associated transmission lines and is expected to cost US\$ 12.047 billion<sup>3</sup>, of which IBRD will provide financing of about US\$ 3.05 billion. This loan will be provided against supply and install and civil construction contracts for the power plant and associated transmission lines.
  - (b) Component B includes investments in renewable energy (100-MW Sere Wind Power Project and 100-MW Upington Concentrating Solar Power Project). This component is estimated to cost US\$ 1.228 billion, of which IBRD will provide financing of about US\$ 260 million. CTF will provide financing of about US\$ 250 million (with the proposed IBRD loan). An additional US\$ 100 million from CTF – US\$ 50 million each for the Sere Wind Power Project and the Concentrating Solar Power Project -- is contemplated through the AfDB.
  - (c) Component C includes both sector investments and technical assistance to support lowering of Eskom's carbon intensity through energy efficiency. The Majuba Rail Project (shift in transportation mode from road to rail) and technical assistance for assessing the opportunities for coal-fired power plant efficiency improvements are envisaged under this component. This component is estimated to cost US\$ 537.57 million of which US\$ 440 million will be financed by IBRD.
27. The project comprises about US\$ 1.766 billion of Low Carbon Renewable and Energy Efficiency investments, of which IBRD will finance US\$ 700 million and CTF will finance US\$ 250 million.

## II. Safeguard policies that might apply

28. The World Bank safeguards policies applicable to this project are Environmental Assessment, Natural Habitats, Physical Cultural Resources, Involuntary Resettlement, and Projects on International Waterways. A Safeguards Diagnostic Review (SDR) has been carried out in accordance with OP 4.00 *Piloting the Use of Borrower Systems to Address Environmental and Social Safeguards Issues in Bank-Supported Projects* to determine whether South African systems can be used in the first four of those policy areas. (OP 4.00 does not authorize country system piloting for the International Waterways policy.) The findings of the SDR are: (i) that South African legislation and regulations and Eskom policies and procedures meet the objectives and operational principles in all of the eligible policy areas as defined in Table A1 of OP 4.00, with gap-filling needed (and already accomplished) for Involuntary Resettlement; and (ii) that Eskom's performance in implementing the national environmental and social safeguards and its own policies is acceptable to the Bank. Country systems will accordingly be used in this project for all applicable safeguards policy areas except Projects on International Waterways, for which GoSA is in compliance with OP 7.50.

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<sup>3</sup> The estimate project total cost is based on Interest during Construction directly related to debt that has been raised by Eskom for the Medupi power plant. Any Eskom funding costs for its contributions to the Plant from the Balance Sheet have not been included and have been considered as Eskom equity to the project.

### III. Tentative financing

Source:	(\$m)
Borrower	4,688.06
International Bank for Reconstruction and Development	3,750.00
Clean Technology Fund	350.00
Foreign Multilateral Institutions	2,663.80
<u>Other Lenders incl. Bilaterals and Commercial Financing</u>	<u>2361.46</u>
<b>Total</b>	<b>13,813.32</b>

### IV. Contact points:

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