

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

Report No.: 47207

<b>Project Name</b>	Botswana - Morupule B Generation and Transmission Project
<b>Region</b>	AFRICA
<b>Sector</b>	Power (80%); Mining and other extractive (20%)
<b>Project ID</b>	P112516
<b>Borrower</b>	
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<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>	January 7, 2009
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<b>Estimated Date of Board Approval</b>	May 28, 2009

## Key development issues and rationale for Bank involvement

### Key Development Issues

Botswana, a landlocked country of about 1.8 million inhabitants, is an African success story with a remarkable record of economic growth and transformation from one of the poorest countries in the world to a middle-income country today. Botswana's high and sustained growth – nine percent per annum in the four decades following independence – is remarkable; making the country one of only thirteen in the world during the postwar period (*The Growth Report*, Commission on Growth and Development). Such growth has been driven by the discovery of vast mineral resources (mainly diamonds, but also nickel, copper, and gold), democratic governance, and political and macro-economic stability. Since the 1990s, however, Botswana's growth has been slowing down and diamond production is forecast to slow down after 2017. Before 2020, non-diamond growth needs to accelerate significantly in order to avoid a contraction of the economy. New copper and nickel mines, as well as expansion of existing ones, are planning to start operations within the next two years.

Despite its economic success and MIC status, poverty and unemployment are persistent development challenges for Botswana. The incidence of poverty in Botswana is deeper than in countries of similar income, with about one third of the population still living on less than US\$1 a day, because of the country's narrow economic base which limits employment opportunities, particularly in rural areas where the majority of the population still resides. Unemployment has been persistently above 20 percent and while the more recent figures show a drop to 17.6 percent, unemployment continues to be a serious problem affecting particularly the young. Mining and non-mining private sector growth is essential to create jobs and alleviate poverty. The Government strategy for economic growth is predicated on diversification away from diamond mining, including in non-metal mining.

Key to Botswana maintaining its successful development path is the energy sector. Botswana's energy demand was about 3660 GWh in 2008 (peak load of 500 MW), which is projected to grow at about 6 percent per annum reaching 5300 GWh by 2017 (peak load of 850 MW) and 6890 GWh by 2026 (peak load of 1130 MW). The mining sector accounts for about 50 percent of the demand, the commercial sector about 20 percent, and the residential sector about 25 percent. Between 2004 and 2007, rural access to electricity doubled to 44 percent, though short of the 60 percent target under the National Development Plan. The Government's "Vision-2016" aims at 100 percent rural access to support the broader development goals of access to education and health, as well as employment opportunities, to the rural and the disadvantaged population.

The deepening energy crisis across the Southern Africa sub-region is a major impediment to Botswana's economic growth plans, poses a threat to stability, and requires a major concerted effort at the national and regional levels to address the energy challenge. Botswana, like several other countries in the Southern Africa sub-region, have until now relied on inexpensive, abundant, and reliable electricity from South Africa. In 2008, Botswana imported about 2440 GWh (67 percent of its power requirements) from Eskom, the national electric utility of South Africa, while its own small 25-year-old coal power plant (Morupule A, 4 x 33 MW) provided about 22 percent. The sub-region, including notably South Africa and other neighbors to Botswana, have been experiencing severe shortages of power since end-2007 due to high growth and lagging investments in new capacity. South Africa had started load-shedding intermittently since December 2007, a condition that is anticipated to worsen through the medium term until ample new generation capacity is built and commissioned. Botswana is also experiencing blackouts and is contemplating load-shedding due to its significant dependence on Eskom, which has reduced its supply commitments from current levels to zero in 2013 onwards under a new sales agreement. There is growing social and political pressure in South Africa to stop exports to other countries. Energy security has emerged as the major national imperative for the Government of Botswana. There is deep concern in the Government that the energy situation might lead to a crisis of confidence and political instability, which the country cannot afford.

The Government's strategy to respond to the challenge is comprehensive, addressing the short-to medium-term as well as long-term issues in energy. The main elements of the Government's strategy are summarized under three themes: (i) energy security aspects, including energy conservation and efficiency, prudent development of domestic energy resources, attracting private sector, etc.; (ii) natural resources and safeguards aspects to promote responsible use and

approach to environmental and social impacts; and (iii) broader development aspects to address national, regional, and global concerns (e.g., climate change).

### Rationale for Bank Involvement

The Government and Botswana Power Corporation (BPC) have called on the Bank to partner in the country's energy sector development at the policy, strategy, and investment levels. This includes a request for provision of an IBRD loan and/or guarantees for the Morupule B project and associated investments. The Government and BPC desire that energy sector development, especially coal power projects, be implemented consistent with appropriate best practices for minimal environmental and social impacts, and that the cost of energy from the project be affordable. The African Development Bank, other DFIs, and commercial banks are also expected to participate in the financing of the proposed project.

Morupule B is a large-scale coal power project for Botswana, which has no prior experience in financing and managing such a project, especially in a time of crisis. The Bank's involvement will help finalize an optimum financing package for the project to achieve lowest possible cost of energy, and through supervision will help BPC monitor the implementation of all aspects of the project. Botswana has limited experience in monitoring, evaluating, and enforcing environmental and social aspects for a project of this scale. Botswana also needs to develop policy and regulatory frameworks to enable public and private sector investors and operators in the energy sector. Through project supervision, the Bank will support these developmental aspects, as well as build capacity in the relevant Botswana institutions. The Bank will also support the Government's and BPC's efforts on short- to medium-term energy security options, including multi-fuel independent power producers, short-term leasing of generators, etc., with participation of the mining sector. The Bank involvement in the project will support the Government's energy access, employment creation and poverty reduction goals.

On carbon dioxide emissions management, the Bank has an ongoing technical assistance grant to support Botswana's Designated National Authority to identify and promote Clean Development Mechanism projects. These include exploring energy efficiency in the mines and in households, among other opportunities. The Bank will also help Botswana examine new technologies (solar power for pre-heating of feedwater, coal-bed methane, carbon dioxide capture and storage, etc.) to develop a portfolio that lowers its carbon fuel impacts, which would help set feasible benchmarks for other countries in the sub-region for evaluation of these approaches in energy sector development. Botswana has indicated interest in accessing post-2012 resources of carbon finance through the Bank's proposed Carbon Partnership Facility as well as through the broader carbon markets.

Therefore, the Bank's support for the proposed project in Botswana would lay the foundation to help meet Africa's increasingly urgent need for generation from all sources in a manner that is consistent with the World Bank's *Clean Energy for Development Investment Framework* and supports the World Bank's Africa Region energy strategy. It also supports the approach to provision of energy from coal presented in the draft Concept and Issues Paper on *Towards a Strategic Framework on Climate Change and Development for the World Bank Group*. The project would thus also support engagement with Botswana on issues of mitigation and adaptation to climate change.

## **Proposed objective(s)**

The project objectives are to (a) expand domestic power generation capacity that will support sustained economic growth in Botswana, and (b) build institutional capacity for sustainable development of the energy sector.

## **Preliminary description**

The proposed scope includes the Morupule B power station, transmission lines and substations, water supply connections, and technical assistance (TA). The Morupule B power station consists of a 600 MW (4 x 150 MW) coal-fired circulating-fluidized-bed power plant, close to the existing Morupule A power station in the township of Palapye, northeast of Gaborone. The plant will include: coal yard and coal preparation equipment, coal crushers, limestone preparation and feed systems, boilers with associated particulate removal equipment, fans, steam turbine, and balance of plant. Also, the plant will be equipped with air-cooled condensers to minimize the use of water. Morupule B will be a new plant, but it would utilize existing infrastructure including roads, coal transport system, water supply, and solid waste disposal facilities. BPC will own and operate the power station.

The transmission line component includes the following: Isang 400/220-kV substation, Morupule–Phukoje 400-kV line (102 km), Isang–Morupule 400-kV line (215 km), Morupule–Isaang 220-kV tee in two lines, Morupule–Phukoje and Morupule–Isang fiber optic lines, reactive power compensation equipment and control equipment.

The water supply component includes an interconnection to the North-South Carrier and, as a backup water supply, water wells and pipelines.

The TA component covers three main areas: (a) power systems (automated control system software, system harmonic studies, control area establishment, and training); (b) Morupule A power station (operational improvement study and feasibility studies for solar pre-heating of feedwater and carbon capture and storage); and (c) sector development ((i) regulatory agency implementation and capacity building, including measures for environmental and social aspects of the power plant, transmission lines, and coal mine; and (ii) regional environmental assessment (REA) to examine the cumulative impacts, particularly on air quality and water resources, of all the existing and planned energy sector investments on both sides of the border with South Africa).

## **Safeguard policies that might apply**

The proposed project has a safeguards policies rating of Category A. Operational Policy (OP) 4.01 Environmental Assessment and OP 4.12 Involuntary Resettlement will apply. During

appraisal, Bank staff will ascertain the applicability of other OPs, particularly OP 4.10 Indigenous Peoples, OP 4.11 Physical Culture Resources, and OP 4.37 Safety of Dams.

BPC has prepared an environmental impact assessment (EIA) for the Morupule B power station; EIAs are in process for the transmission and water supply components. The power station EIA indicates that current levels of emissions from Morupule A cause occasional local exceedances of national and international standards for sulfur dioxide (SO<sub>2</sub>), which under World Bank guidelines will require mitigation measures at Morupule A to offset the additional emissions from Morupule B.

A social impact assessment has been carried out for Morupule B and for the transmission lines. It is expected that the Morupule township would be adversely affected from a large influx of construction workers and informal job seekers from both inside of Botswana and adjacent countries. Municipal, health, and social services would be affected, and there are concerns about HIV/AIDS. Within the immediate area of the proposed Morupule B power station, there is reportedly one family of squatters; the process of re-locating that family is underway. BPC is planning to fence the area to be developed under Morupule B. With respect to the transmission lines, the SIA summary indicates that there is potential negative impact on land use and possible resettlement of individual households.

## Tentative financing

Source:	US\$ million
Botswana Power Corporation/Government of Botswana	800
Commercial Banks (covered by IBRD Guarantees)	350
World Bank, African Development Bank, ECA, other DFIs	450
Total	1,600

## Contact point

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