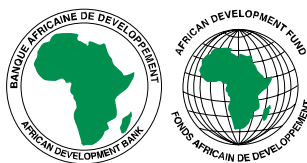


**AFRICAN DEVELOPMENT BANK GROUP**



**BOTSWANA**

**MORUPULE POWER PROJECT**

**Project Performance Evaluation Report (PPER)**

**OPERATIONS EVALUATION DEPARTMENT  
(OPEV)**

**28 May 1997**

## 1. PROJECT BACKGROUND AND FORMULATION

1.1 A pre-feasibility study, whose aim was to meet the growing power demand in medium term recommended, in March '1981, a master plan for the development of the Botswana electrical system up to the year 2000 and, confirming a previous pre-feasibility study, the scaled development of a complete 3 x 30 MW coal-fired power station in Morupule and the interconnection of Shashe (Northern) and Southern divisions, formerly separately operated, before further extensions. Morupule Power Project (MPP) was the first phase of a **three-staged** development aiming at installation of 90 MW in 1988, 90 MW in 1990 in order to reach 420 MW installed capacity by the year 2000.

1.2 The Government of Botswana (GOB) requested on April 7, 1981 and obtained financial assistance in foreign currency from the African Development Bank Group (ADB), the Arab Bank for Economic Development in Africa (**BADEA**), the Commonwealth Development Corporation (CDC), the European Investment Bank (EIB), Export Credit, the International Bank for Reconstruction and Development (IBRD), the Kreditanstalt für Wiederaufbau (KfW), the Kuwait Fund, the Nordic Investment Bank (NIB) and the Saudi Fund. The United Kingdom Government offered a grant. The Government of Botswana provided funds for taxes in foreign exchange and co-financed with Botswana Power Corporation which covered the local currency cost of the project.

1.3 After the Bank had launched a mission for the project pre-appraisal (**August** 1981) and participated in co-financiers' meeting in November 1981, it considered the financing gap and, on request of the Government of Botswana, decided to increase its loan amount from UA 10.00 million, initially offered, to UA 20.00 million in April 1982. The Loan Proposal (ADB/OPS/BSW/PU/07) was submitted to the Board (September 1982) who approved a loan of UA 20 million on September 30, 1982. This loan was the eleventh operation of Bank Group in Botswana but the first in the electricity sub-sector.

1.4 After the completion of works, practically within scheduled duration and with an unused balance of UA 6.50 million, the Borrower submitted the Project Completion Report (PCR) on May 17, -1989. The Bank launched the PCR mission in December 1994 who prepared a high quality report. As the project was successfully implemented and there were no outstanding issues to be dealt with, the Bank decided that no full project performance audit on site was necessary and therefore prepared this Abbreviated Project Performance Audit Report on the basis of available documents in the Bank.

## 2. PROJECT SECTOR GOALS, OBJECTIVES AND OUTPUTS

### 2.1 Energy sector

2.1.1 The main proven energy resource of Botswana is coal with 100 billion tonnes of geological resources and 3.5 billion tonnes of technically and economically recoverable reserves. Botswana has limited wood fuel reserves and no sites suitable for hydro-electric development. Wind and solar development is at the pilot model stage. Primary energy consumption in 1992 was covered mainly by woodfuel (56.9 %), coal (23.7 %) and imported oil and electricity (19.4 %). Energy consumption per sector was

as follows in 1992: household (45.6 %), transport (24.2 %), industries (22.8 %), agriculture (1.1 %) and others (6.3 %).

2.1.2 The **Ministry** of Mineral Resources and Water Affairs (MMRWA) has the overall responsibility for **the** energy sector (formulation, direction and co-ordination of energy policy) through its Energy Affairs Division. The Botswana Power Corporation (**BPC**), a parastatal, has the monopoly for power generation, transmission and distribution in Botswana. Following Ministries and Government Institutions have activities related to energy sector issues and policy:

- i) Ministry of Commerce and Industry for supply, pricing and storage of petroleum products;
- ii) Ministry of Agriculture for forest and biomass management including woodfuel;
- iii) Ministry of Works and Communications for power supply to government institutions in rural areas through its Department of Electrical and Mechanical Services (DEMS);
- iv) Ministry of Local Government, Lands and Housing for environmental issues and determination of policies for the infrastructure development of residential areas;
- v) Parastatal Organizations such as Botswana Technology Centre and the Rural Industries Innovation Centre for the development of appropriate energy technologies.

2.1.3 As by the Seventh National Development Plan (1991-1997), the main objectives of energy sector policy are:

- i) to secure a cost-effective supply of energy by choosing an appropriate mix of energy sources to meet future energy demand;
- ii) to diversify supplies in order to reduce dependency on any particular source;
- iii) to develop and manage indigenous resources in order to increase self-sufficiency and sustainable development;
- iv) to ensure that energy related activities are performed in an environmentally sound manner.

## **2.2 Electricity sub-sector**

2.2.1 Since the implementation of Morupule Power Project, **BPC's** installed generating capacity was increased from 109 MW in 1982 to 197 MW in 1986 through on one hand the erection of 132 MW at Morupule, and 65 MW (available: 45 MW) at Selebi-Phikwe and on the other hand the decommissioning and retirement of old and

expensive thermal power stations in Gaborone. The 4 MW Maun diesel station was expected to be retired after the commissioning of the 132 kV Francistown - Maun line. DEMS operated diesel installed capacity of 20 MW in rural areas. Electricity sales totalled 807 GWh in 1986 with 40 % for Bamangwato Concessions Limited (BCL) alone. During the period from 1983 to 1994, the growth of energy demand was 8.2 % and the number of consumers was increasing facilitated by the provision offered by the Government to fund 60 % of the cost of extensions for group of rural consumers.

2.2.2 Agreements between, BPC and ESKOM of South Africa, Zambia Electricity Supply Corporation (ZESCO) and Zimbabwe Electricity Supply Authority (ZESA) entitled BPC. to import up to 200 MW from South Africa through the 220 and 132 kV lines and surplus hydro energy from Zambia through the 33 kV line and Zimbabwe (120 MW) through the 220 kV line.

2.2.3 The objectives of electricity sub-sector national policy are defined in the Fifth National Development Plan as follows:

- i) to minimize dependence on imported oil substituting imported oil by domestic coal for power generation;
- ii) to ensure adequate supply of electricity to the new mines and industries needed to fulfil the-plan's production and employment objectives through a long-term programme for power generation, transmission and distribution for the late 1980's and beyond;
- iii) to minimize the costs of electricity to industrial and private users by improved generation and distribution;
- iv) to avoid subsidizing private urban consumers while maintaining the element of intra-urban cross subsidy.

### 2.3. Project Objectives and Outputs

2.3.1 The project objective was to increase power generation erecting a domestic coal-fired power station in Morupule and to interconnect the Northern and the Southern power grids.

2.3.2 This project is in line with the national sub-sector policy which encourages the replacement of imported oil by domestic coal in power generation, reducing therefore the country's energy dependence and reinforcing electricity supply for new mines and industries.

2.3.3 The ADB loan was initially expected to finance the turbo-generators and ancillary equipment but the scope was revised; the Bank co-financed the boilers due to the disagreement between Bank and GOB on the choice of contractor because Bank's guidelines for international competitive bidding were not respected.

### 3. IMPLEMENTATION PERFORMANCE

3.1 The duration of project implementation was scheduled from June 1981 to June 1986 (60 months); but actual implementation run from October 1981 to October 1986.

3.2 The overall project was implemented as defined at preparation, i.e. to provide water supply gravity main, additional 90 MW generation capacity, construction of 220 kV Morupule-Selebi Phikwe (78 km) and Morupule-Gaborone (268 km) transmission lines and of 10 km of 132 kV Gaborone-Segodishane tie-line, construction of 220 kV Morupule substation, 220/132 kV Segoditshane substation, 132 kV Gaborone South substation, installation of a system control centre complete with Supervisory Control And Data Acquisition' (SCADA) and Power Line Carrier (PLC) and engineering. But, in order to reduce costs, without affecting quality and efficiency of the project, self-supporting towers for tangent towers were replaced by guyed towers, and asbestos pipes were used instead of proposed steel pipes.

3.3 At completion, total project cost left an unused balance of UA 29.8 million, i.e 17 % of estimated cost. The ADB loan left an unused balance of 33 % (UA 6.50 million) which was cancelled. These savings were a combined result of unused provisions for contingencies and steady depreciation of the national currency (Pula).

3.4 With the operation of the 3 x 30 MW installed in the first phase of project and the commissioning of the fourth unit in 1989, power supply was sustained to meet the increasing demand. Energy generated by Morupule Power Station represents 90 % of domestic power supply. After the implementation of MPP and interconnection of national power grid in 1986 following results were registered:

- i) the number of consumers grew at an average rate of 15% per year from 13,979 in 1986/86 to 36,121 in 1993/94;
- ii) Power demand grew from less than 90 MW in 1981 to 194.7 MW in 1994/95 while sales were increased from 659 GWh in 1986/87 to 1106 GWh in 1994/95;
- iii) Availability was 90 % and load factor was 75 %, but auxiliary consumption of Morupule power station was high (11-12 %);
- iv) FIRR was 12.5 % at project appraisal and 11 % at project completion mainly due to low rate of tariffs' increase (5 %) which is lower than the rate of inflation (10 %)(PCR para.6.4.2)
- v) EIRR was 13.4 % at appraisal and 17.6 % at project completion, although economic benefits from oil savings at Orapa power plant were omitted;
- vi) total net maximum capacity (including import) was 497 MW while system peak demand was only 205 MW in 1994/1995;

- vii) more than Pula 22.19 million out of a total of Pula 30.50 million were accounts receivable from commercial and domestic consumers in 1334; share of these two categories in power consumption was increasing from 21 % in 1986/1987 to more than 42 % in 1995/96.

Furthermore, after completion of MPP, running of diesel units in Gaborone (12 MW) and in other towns was, stopped improving therefore power supply reliability and availability.

3.5 A. The following conditions of the loan indicated that for the first disbursement the Borrower, shall have:

- i) indicated to the Bank and obtained its approval of the procedure proposed for ICB;
- ii) submitted to the Bank the list of goods and services to be financed by the loan resources;
- iii) given an undertaking to the Bank to assume responsibility to meet all costs overruns of the project;
- iv) given an undertaking to the Bank to make adequate annual budgetary -locations, or make other provisions, satisfactory to the Bank to meet its annual commitments and over its share of the project cost, throughout the implementation period of the project;
- v) concluded a subsidiary loan agreement with BPC for on-lending the proceeds of the loan on the same terms and conditions as foreign set forth;
- vi) signed (the Borrower or BPC) with the Kuwait Fund, Saudi Fund, BADEA, IBRD, EIB and CDC the financing arrangements for obtaining complementary funds necessary for the execution of the project;
- vii) given an undertaking to the Bank that the Borrower or BPC will promptly raise funds adequate to cover any shortfall in the financing of the project;
- viii) caused BPC to undertake to make available as and when requested, its contribution to the project cost, and shall have given to the Bank an assurance that such an undertaking shall have been fully respected;

B. Other conditions of the Bank were:

- i) to cause BPC to prepare and submit to the Bank by 30/06/83 a detailed training programme suitable to meet its future operation

needs paying special attention to the operation and maintenance of the power plant and the power system control centre;

- ii) to cause BPC to complete and submit to the Bank a tariff study by 31st December 1983 and implement the recommendations thereof in consultation with the Bank;
- iii) to ensure that no local taxes, customs duties or levies of any kind whatsoever are financed by the proceeds of the Bank loan.

The conditions A.iv), vii), viii) and B.iii) are redundant with the general conditions applicable to loan and guarantee agreements and were not to be specified. The other requirements and covenants for loan effectiveness, were adequate for a normal project like MPP and were fully complied with. The tariff review study was completed in November 1983, i.e. within convened schedule; but out of its recommendations only the establishment of uniform national tariffs was implemented in July 1988 with the objective of moving later towards Long Run Marginal Cost tariffs.

3.6 MPP brought also social benefits: increase of employment in coal mines and in Morupule Power Station and establishment of new infrastructures for education and health.

3.7 Contracts awarding complied with requirements of the respective Financing Agencies. But as stated above, ADB loan was expected to finance the Turbines component. During the procurement process, the Government of United Kingdom (UK) offered to the GOB a grant to support contract awarding to NEI-Parsons (a British company), whose bid was not the lowest. The Bank considered that this procedure was not in compliance with the Bank's rules and did not accept the recommendation of the GOB to award the contract to NEI-Parsons. Therefore, on request of the GOB, the Bank's Board approved the GOB's proposal to co-finance the Boilers component with EIB, NIB, KFW and GOB/BPC, the contract of which was awarded in line with the Bank's rules. To avoid such cases, a fair play agreement between co-financiers should be established.

3.8 Following actions were undertaken to limit environmental negative impacts of Morupule power station:

- i) control of dust emission within internationally acceptable limits by the use of pulverized coal, of better combustion technology and of electrostatic precipitator for gases discharges
- ii) prevention of water pollution and use of ash in cement factory
- iii) regular monitoring of water quality
- iv) control of noise emission within internationally acceptable limits

4. **PERFORMANCE OF THE BORROWER, THE EXECUTING  
-AGENCY, THE BANK AND THE CONTRACTORS**

4.1 The Government of Botswana, aware of the relevance of Morupule Power Plant for the country development, was fully committed to the project implementation from design to commissioning and its commitment to fund taxes that were to be paid in foreign exchange in compliance with the South African Customs Union ( 10 % of total cost) contributed to convince Financing Agencies to participate in the project funding. But the GOB, considered the advantages offered by the UK grant to be provided if the contract for turbogenerators was awarded to a **British** company, and ignored therefore the fair play among competitors and the Bank's guidelines stated in the loan agreement as regards international competitive bidding.

4.2 BPC maintained good relations with all parties involved in the project implementation and carried out an efficient management for its successful execution. BPC reported regularly to the Bank but there was no transfer of technology, the project team being comprised almost entirely by expatriates. The study on tariff policy was prepared in due time but its implementation was delayed.

4.3 The Bank was satisfactorily involved in the project preparation, appraisal and implementation and it did not require the cross-effectiveness of loans and facilitated therefore the project implementation. But Bank's follow-up for correction of boiler technology was not sufficient. **The Bank maintained** a firm position regarding the respect of its guidelines in international competitive bidding. Nevertheless, its field supervision of implementation was limited to one mission and contractors complained the Bank's slow disbursement-procedure.

4.4 The overall performance of the consulting engineer was satisfactory mainly as regards the project supervision. However, he based the design of boilers on European temperatures and coal characteristics instead of local temperatures and characteristics of Botswana coal. Furthermore, he adopted a **combustion** technology which is too sophisticated and he under estimated the operational man power required for Morupule power station.

4.5 Contractors' overall performance was satisfactory; but the contractor for boilers failed to adapt combustion system to local coal characteristics.

5. **PROJECT SUSTAINABILITY**

5.1 The use of domestic coal instead of imported oil and the increase of power generating capacity would increase revenues from coal mines and reduce expenses in foreign exchange and dependence on import of both oil and electricity.

5.2 Morupule power station, as an alternative source of power supply, offered to BPC a firm basis for tariff negotiations with ESKOM. A study on tariff for the regional power market should be carried out in order to set up an adequate strategy of power supply: either domestic coal-fired based or import from thermal sources in South Africa and from hydro resources in Zambia. Furthermore, besides the planned

implementation of a structure of tariff based on uniformity and on coverage of all costs, BPC should also revise the low tariff for BCL at the end of Shashe Agreement in late 1990's. Billing and collection are satisfactory but there is room for improvement as regards domestic and commercial consumers.

5.3 To sustain the institution, BPC has prepared a sound training program aiming at eventual replacement of expatriates by Botswana citizens which would be implemented. Furthermore, to ensure efficient operation and maintenance of Morupule power station, BPC should set up a programme for the purchase of spare parts.

## 6. PERFORMANCE AND OUTCOME RATINGS

6.1 The overall assessment of Implementation Performance has a score of 3.20 which is highly satisfactory.

6.2 The Bank's Performance is satisfactory with a score of 2.50.

6.3 The overall assessment of outcome Performance has a score of 3.11 which is highly satisfactory.

Details of assessment are reported in Annex 2.

## 7. CONCLUSIONS, LESSONS AND RECOMMENDATIONS

### 7.1 **Conclusions**

7.1.1 The project promoted the use of domestic resources instead of imported oil for electricity supply and set up a reliable interconnected grid. Thus, mining industries were facilitated and new jobs were created (PCR para. 8.1.2).

7.1.2 The new tariff policy should be efficiently implemented to cover all BPC's costs and spare parts should be purchased in order to ensure a regular and efficient maintenance of both power generation system and power distribution system (para.5.3).

### 7.2 **Lessons learnt**

7.2.1 Following lessons were drawn in the PCR prepared by the Bank's mission:

- i) important modification of large and capital intensive projects require an in-depth and comprehensive technical appraisal (PCR 8.2.1);
- ii) failure of consultant in project design concerning the combustion system affected the power plant performance (PCR 8.2.2);
- iii) local staff should be directly involved in projects implementation in order to take benefit of training in project management and operation (PCR para. 8.2.3);

- iv) advance procurement for projects with large and capital intensive projects helped to avoid delays, cost overruns and under-financing (PCR 8.2.4).

7.2.2 Furthermore, following lessons were drawn at project auditing:

- i) total net maximum installed capacity was more than 2.4 times system peak demand (para.3.4);
- ii) commercial and domestic consumers totalled 72 % of total accounts receivable and more than 42 % of electricity consumption (1995/1996) (para.3.4);

### 7.3 Recommendations

7.3.1 The PCR recommended following actions:

- i) modifications for large and capital intensive projects should be accurately appraised (PCR para. 8.2.J);
- ii) suitable provisions for penalties against relevant performance failure should be included in the contract of consultants (PCR para.8.2.2);
- iii) the improvement of project management by local staff should be a crucial issue (PCR para. 8.2.3);
- iv) advance procurement should be used -for projects with large components in order to avoid unnecessary delays, cost overruns and under-financing

7.3.2 At project performance audit, following actions are recommended:

- i) a medium term schedule of power supply based on the most cost effective source should be prepared by BPC (para. 3.4);
- ii) BPC should improve collection from domestic and commercial consumers whose share in consumption is increasing (para. 3.4);
- iii) large and capital intensive projects should be accurately designed (para 4.4) and cost properly estimated (para.3.4);
- iv) the Bank should improve its site supervision of projects (para.4.3)
- v) to reinforce the project sustainability, BPC should fully implement its tariff policy (para.5.2)

**SELECTED DATA**

<b>country</b>	:	BOTSWANA
Project	:	Morupule Power Project
Loan Number	:	<b>CS/BSW/PU/82/007</b>
Borrower	:	The Government of Botswana (GOB)
Executing Agency	:	Botswana Power Corporation (BPC)

**A. LOAN**

		<u>Estimated</u>	<u>Actual</u>
Amount (UA million)	:	20.00	13.30
Date of Approval	:		September 30, 1982
Date of Signature	:	<b>December 30, 1982</b>	October 28, 1982
<b>Date</b> of Effectiveness	:	<b>March 30, 1983</b>	September 21, 1983
<b>Date</b> of first Disbursement	:	December 31, 1984	September 1983
Date of last Disbursement	:	December 31, 1988	November 2, 1987

**B. PROJECT**

		<u>Estimated</u>	<u>Actual</u>
<b>Total cost</b> (UA million)	:	<b>185.50</b>	154.70
Sources of Finance			
ADB	:	<b>19.80</b>	13.30
<b>BADEA</b>	:	8.30	2.90
CDC	:	11.80	8.90
E I B	:	14.40	12.60
EXPORT CREDIT	:	23.20	16.10
IBRD	:	31.50	17.00
KUWAIT FUND	:	14.90	7.20
KFW	:		11.30
NIB	:		14.70
SAUDI FUND	:	8.80	6.60
UK GRANT	:		5.70
<b>GOB/BPC</b>	:	53.00	38.20

		<u>Estimated</u>	<u>Actual</u>
Implementation Duration	:		
Total Project		60 months	60 months

		<u>Date</u>	<u>Reference</u>
Appraisal Report	:	September 1982	ADB/OPS/BSW/PU/01
Project Completion Report	:	<b>20/11/1995</b>	ADB/BD/IF/95/252

**C. PERFORMANCE INDICATORS**

Unused Loan Balance (ADB loan)	UA 6.50 million
Time Overrun (ADB loan)	0 month
Overall Project Performance	Highly satisfactory
Project Implementation Performance	Highly satisfactory
Performance of Bank	Highly satisfactory

**PERFORMANCE RATINGS**

**FORM IP 1**

**IMPLEMENTATION PERFORMANCE**

N°	COMPONENTS INDICATORS	MARK (1 to 4)	REMARKS
1	Adherence to Time Schedule	4	The project was completed within five years as initially scheduled
2	Adherence to Cost Schedule	2.5	Total cost underrun was 17 % while ADB loan registered an underrun of 33 %.
3	Compliance with Covenants	2.5	Covenants were complied with but the GOB did not fully respect rules of international competitive bidding and BPC did not adopt the new tariff policy in due time.
4	Adequacy of Supervision and Reporting	3.5	Supervision and reporting by consultants and by BPC were good.
5	Satisfactory Operations (if applicable)	4	The new power plant and the interconnected grid are operated reliably.
	Overall Assessment of Implementation Performance	3.3	Project implementation was highly satisfactory

**FORM BP 1**

**BAN-K PERFORMANCE**

<b>N°</b>	<b>COMPONENT INDICATORS</b>	<b>MARK (1 to 4)</b>	<b>REMARKS</b>
1	At Identification	3.5	The Bank identified power needs of the Country
2	At Project Preparation	4	The Bank participated in the project preparation and feasibility study
3	At Appraisal	3.5	The Bank participated in appraisal but failed to insist on required modification
4	At Supervision	2	The Bank launched only one site supervision mission during five years
	Overall Assessment of Bank Performance	3.25	Bank's performance was highly satisfactory

**FORM PO 1**

**PROJECT OUTCOME**

N°	COMPONENT INDICATOR	MARK (1 to 4)	REMARKS
<b>1</b>	<b>Relevance and Achievements of Objectives</b>	<b>3.2</b>	<b>Highly satisfactory</b>
i)	Macro-economic Policy	3.5	The project reduced expenses of foreign exchange for power import and for oil to be used in power generation ; power generation and power system reliability were improved and tariffs were homogenized. These achievements were in line with the National Development Plan.
ii)	Sector Policy	3.5	Domestic energy resources were used to increase power supply, power system reliability was improved and electricity became more accessible in line with Sector Policy Objectives.
iii)	Physical (including Production)	3.5	Capacity of 90 MW was installed and operated with highly rated availability and reliability.
iv)	Financial	3.5	The project was implemented within budget and FIRR was satisfactory.
v)	Poverty Alleviation & So&al & Gender	3	Provided that electricity accessibility is <b>facilitated</b> by electrification program and adequate tariff, that new jobs are created in mining sector, the project performance is satisfactory.
vi)	Environmental	3	As far as atmospheric emissions are within acceptable limits, water quality is monitored by BPC and ash would be used in cement factory, the MPP had no negative environmental impact.
vii)	Private Sector Development	2.5	Availability of electricity would favor the development of private sector though this was not directly addressed by the project objective.
viii)	Other (specify)	N/A	
<b>2</b>	<b>Institutional Development</b>	<b>2.7</b>	<b>Satisfactory</b>
i)	Institutional Framework including Restructuring	3	The institutional frame was adequate but tariff implementation would be improved
ii)	Financial & MIS including Audit Systems	3	Financial management and auditing were satisfactory
iii)	Transfer of Technology	2	Local staff was not trained.

iv)	Staffing by qualified persons (including turnover) Training & Counterpart staff	2.5	Only expatriates were involved and training of local staff would be reinforced
<b>3</b>	<b>Sustainability</b>	<b>3.3</b>	<b>Highly satisfactory</b>
i)	Continued Borrower Commitment	4	After completion of first phase of project, the Borrower reinforced the plant with a fourth 30 MW generator.
ii)	Policy Environment	3	Availability of reliable power supply would help woodfuel consumption to decrease.
iii)	Institutional Framework	2.5	BPC's institutional frame was adequate but there is room to increase involvement of local staff
iv)	Technical Viability and Staffing	3	Even if highly sophisticated technology may require expatriate experts, local staff should be trained for long term sustainability.
v)	Financial Viability incl. Cost Recovery System.	3	Regular and proper review of tariffs would ensure the project financial viability.
vi)	Economic Viability	3	Growth of mining sector activities facilitated by more available and more reliable power would sustain the economic viability of project
vii)	Environmental Viability	3	Undertaken actions to protect the environment and utilization of ash in cement factory, project's environmental viability would be ensured
viii)	O & M facilitation (availability of recurrent funding, foreign exchange, spare parts, workshop facilities)	3	Provided the presence of expatriate experts and trained local staff and an adequate schedule for O & M, Morupule power station would be properly operated and maintained.
<b>4</b>	<b>Economic Internal Rate of Return</b>	<b>3</b>	<b>Satisfactory</b>
	<b>Overall Assessment of Outcome</b>	<b>3.1</b>	<b>Highly satisfactory</b>

PROJECT RETROSPECTIVE CHART

Project: Morupule Power Project

Completion Date: June 1993

PCR Date: April 1995

Audit Date: February 1997

Retrospective Evaluation Team: A.B.SEMANOU + E.B.MUNYAZIKWIYE

Narrative Summary	Verifiable Indicators		Means of Verification	Assumptions (Verifications)
	At appraisal (1991)	At post-evaluation (1996)		
<p><b>Sectoral Goal:</b></p> <p>1. The main axes of enrgy sector goal are cost-effective energy supply to meet demand, diversification of supply sources and development of domestic resources for a sustainable development and a healthy environment</p>		<p>1. Domestic coal-fired power plant operated</p> <p>2. Diesel power station downgraded</p>	1. BPC's Annual Report	
<p><b>Project Objectives:</b></p> <p>1. Installed capacity increased by additional 90 MW</p> <p>2. Interconnection of national power system</p> <p>3. Set up of a control centre for national power system</p>		<p>1. Additional 90 MW installed</p> <p>2. 346 km of 220 kV OHL constructed</p> <p>3. 10 km of 132 kV OHL constructed</p> <p>4. Construction of 3 substations</p> <p>5. Complete power control centre constructed</p>	1. BPC's Annual Report	<p>1. <b>Generating</b> capacity improved</p> <p>2. <b>Power</b> system reliability and availability improved</p> <p>3. <b>Reduction</b> of expenses for electricity import</p>
<p><b>Outputs (achieved components) :</b></p> <p>1. 3 x 30 MW domestic coal-fired operated within the end of 1986</p> <p>2. national 220 kV and 132 kV interconnected</p> <p>3. power system control centre operated</p>		<p>1. 90 MW capacity installed</p> <p>2. 700 GWh generated per year</p> <p>3. Availability increased to 90 %</p>	1. BPC's quarterly progress reports	<p>1. Power dependence reduced</p> <p>2. Mining activities sustained</p> <p>3. Reinforcement of <b>BPC's</b> position in tariff of imported power negotiation</p>

# PROJECT RETROSPECTIVE CHART

Project: Morupule Power Project

Completion Date: June 1993

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Retrospective Evaluation Team: A.B.SEMANOU + E.B.MUNYAZIKWIYE

Activities:	1. Resources: (UA millions)				1. Resources: (UA millions)					
	FC	LC	%		FC	LC	%			
1. Water supply										
2. Civil works										
3. Complete coal-fired power station	ADB	19.8	-	10.7%	ADB	13.3	-	8.6%	1. Appraisal Report	
4. Electrical & Mechanical Equipment	BADEA	8.3	-	4.5%	BADEA	2.9	-	1.9%	2. Loan agreement	
5. 220 & 132 kV lines and substations	CDC	8.9	2.9	6.3%	CDC	8.9	-	5.8%	3. Supply and works contracts	
6. Power system control centre	EIB	14.4	-	7.8%	EIB	12.6	-	8.1%	4. Payment drafts	
7. Engineering	EXP.CR.	23.2	-	12.5%	EXP.CR.	16.1	-	10.4%	5. Quarterly progress reports	
	IBRD	31.5	-	17.0%	IBRD	7.3	9.7	11.0%	6. PCR	
	KF	14.9	-	8.0%	KF	7.2	-	4.7%		
	KFW	-	-	-	KFW	11.3	-	7.3%		
	NIB	-	-	-	NIB	9.4	5.3	9.5%		
	SF	8.8	-	4.7%	SF	6.6	-	4.2%		
	GRANT	-	-	-	GRANT	5.7	-	3.7%		
	GOB/BPC	10.6	42.4	28.6%	GOB/BPC	12.9	25.3	24.8%		
	Total	140.2	45.3	100.0%	Total	114.4	40.3	100.0%		
	<b>2. Schedule</b>				<b>2. Schedule</b>					
	60 months from August 1981				60 months from October 1981					
	Completion: August 1986				Completion: October 1986					
									1. Extension of Morupule power station with additional installed capacity	
									2. Improvement of collection for commercial and domestic consumers	
									3. Eventual review of BCL's tariff at expiration of actual contract	

RECOMMENDATIONS AND FOLLOW-UP MATRIX

MAIN FINDINGS AND CONCLUSIONS	RECOMMENDATIONS	FOLLOW-UP ACTIONS	RESPONSIBILITY
<p><u>Formulation</u> <u>Project Rationale</u></p> <p>i. Combustion system could not be improved during project but the Bank did not strongly insist for correction (para. 4.3 &amp; 4.4).</p>	<p>1. The Bank should require accurate technical design of project before implementation (para. 7.3.2).</p>	<p>1. Elaboration of procedures for Project technical modifications of projects</p>	<p>OCDC - OCDE- OCDN - OCDY - OCDW</p>
<p><u>Project implementation</u></p> <p>2. Rules of international competitive bidding were not respected for procurement of contract for turbo-generators (para. 3.7).</p> <p>3. Total project cost left an underrun of 17 % of estimated total project cost while ADF unused loan balance was 33 % of related cost (para. 3.3).</p> <p>4. The Bank launched only one supervision mission during the five years of project implementation (para.4.3).</p>	<p>2. In case of co-financed projects, a fair play agreement should be set up between financing agencies (para. 3.7)</p> <p>3. Costs of projects should be accurately estimated (para. 7.3.2)</p> <p>4. The Bank should be more involved in supervision of projects for which it provides financing (para.7.3.2)</p>	<p>2. Elaboration of an inter-financiers fair play agreement (if not existing)</p> <p>3. Accurate appraisal for financed projects</p> <p>4. Elaboration of a program for site supervision for each project financed by the Bank</p>	<p>FPOP</p> <p>OCDC - OCDE- OCDC - OCDS - O C D W</p> <p>OCDC - OCDE- OCDC - OCDS - OCDW</p>

**RECOMMENDATIONS AND FOLLOW-UP MATRIX**

<p><u>Compliance with loan Conditions and Covenants</u></p> <p>5. The new tariff policy was neither quickly nor fully implemented (para.3.5 &amp; 4.2).</p>	<p>5. BPC should implement the new tariff policy (para.7.3.2)</p>	<p>5. Act of power new tariffs</p>	<p>- GOB - BPC</p>
<p><u>Performance Evaluation and Project Outcome</u></p> <p>6. BPC's local staff were not involved in the project management and implementation works (para.4.2).</p> <p>7. Combined use of domestic coal and adequate power supply strategy are useful tools to negotiate prices of imported (para.5.2).</p>	<p>6. BPC should reinforce its programm focused on local staff training (para.7.3.1).</p> <p>7. BPC should elaborate a strategy for negotiation of prices for imported electricity (para.5.2).</p>	<p>6. Increase of provision for BPC Scholarship Scheme</p> <p>7. Tariff policy for power import</p>	<p>- BPC</p> <p>- GOB - BPC</p>