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PROJECT PERFORMANCE ASSESSMENT REPORT

MOZAMBIQUE

ENERGY TECHNICAL ASSISTANCE AND REHABILITATION PROJECT (CREDIT 1806-MZ)

URBAN HOUSEHOLD ENERGY PROJECT (CREDIT 2033-MZ)

September 15, 2004

Sector, Thematic and Global Evaluation Group
Operations Evaluation Department

Currency Equivalents (annual averages)

Currency Unit = Meticais (MT)

1987	US$1.00	$ 40.
1988	US$1.00	$ 404.
1989	US$1.00	$12342.
1990	US$1.00	$ 813.
1991	US$1.00	$ 1040.
1992	US$1.00	$ 1748.
1993	US$1.00	$ 2724.
1994	US$1.00	$ 5288.
1995	US$1.00	$ 6537.
1996	US$1.00	$10760.
1997	US$1.00	$10983.
1998	US$1.00	$11710.

Abbreviations and Acronyms

BADEA	Arab Bank for Economic Development in Africa
BDM	Banco de Moçambique
BEU	Biomass Energy Unit of the Ministry of Agriculture
BPD	Banco Popular de Desenvolvimento
CMH	Mozambique Hydrocarbons Company (former ENH)
DNE	Direcçao Nacional de Energia
EDM	Electricidade de Moçambique
ESMAP	Energy Sector Management Assistance Program
FAO	United Nations Food and Agriculture Organization
GOM	Government of Mozambique
GWh	Gigawatt-hour
ICR	Implementation Completion Report
LPG	Liquified Petroleum Gas
Moçacor	Distribuidora de Combestiveis, SARL, subsidiary of PETROGAL Moçambique
NDF	Nordic Development Fund
NDFW	National Directorate of Forests and Wildlife
NORAD	Norwegian Agency for Development Cooperation
OED	Operations Evaluation Department
Petromoc	Petróleos de Moçambique, SARL
PPAR	Project Performance Assessment Report
Prolec	Urban Electrification Program
SIDA	Swedish International Development Agency

Fiscal Year

Government: January 1 – December 31

Director-General, Operations Evaluation	:	Mr. Gregory K. Ingram
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OED Mission: Enhancing development effectiveness through excellence and independence in evaluation.

About this Report

The Operations Evaluation Department assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, OED annually assesses about 25 percent of the Bank's lending operations. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons. The projects, topics, and analytical approaches selected for assessment support larger evaluation studies.

A Project Performance Assessment Report (PPAR) is based on a review of the Implementation Completion Report (a self-evaluation by the responsible Bank department) and fieldwork conducted by OED. To prepare PPARs, OED staff examine project files and other documents, interview operational staff, and in most cases visit the borrowing country for onsite discussions with project staff and beneficiaries. The PPAR thereby seeks to validate and augment the information provided in the ICR, as well as examine issues of special interest to broader OED studies.

Each PPAR is subject to a peer review process and OED management approval. Once cleared internally, the PPAR is reviewed by the responsible Bank department and amended as necessary. The completed PPAR is then sent to the borrower for review; the borrower's comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the OED Rating System

The time-tested evaluation methods used by OED are suited to the broad range of the World Bank's work. The methods offer both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. OED evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (more information is available on the OED website: http://worldbank.org/oed/eta-mainpage.html).

Relevance of Objectives: The extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). *Possible ratings:* High, Substantial, Modest, Negligible.

Efficacy: The extent to which the project's objectives were achieved, or expected to be achieved, taking into account their relative importance. *Possible ratings:* High, Substantial, Modest, Negligible.

Efficiency: The extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. *Possible ratings:* High, Substantial, Modest, Negligible. This rating is not generally applied to adjustment operations.

Sustainability: The resilience to risk of net benefits flows over time. *Possible ratings:* Highly Likely, Likely, Unlikely, Highly Unlikely, Not Evaluable.

Institutional Development Impact: The extent to which a project improves the ability of a country or region to make more efficient, equitable and sustainable use of its human, financial, and natural resources through: (a) better definition, stability, transparency, enforceability, and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Institutional Development Impact includes both intended and unintended effects of a project. *Possible ratings:* High, Substantial, Modest, Negligible.

Outcome: The extent to which the project's major relevant objectives were achieved, or are expected to be achieved, efficiently. *Possible ratings:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry and supported implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of the project). *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower assumed ownership and responsibility to ensure quality of preparation and implementation, and complied with covenants and agreements, towards the achievement of development objectives and sustainability. Possible ratings: Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

Contents

This report was prepared by Rod Janssen (consultant), who assessed the project in February 2004. The report was edited by William Hurlbut, and Rose Gachina provided administrative support.

Principal Ratings

ENERGY TECHNICAL ASSISTANCE AND REHABILITATION PROJECT

	*ICR**	*ICR Review*	*PPAR*
Outcome	Satisfactory	Satisfactory	Satisfactory
Sustainability	Likely	Uncertain	Likely
Institutional Development Impact	Partial	Moderate	Modest
Bank Performance	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	N.A.	Satisfactory

URBAN HOUSEHOLD ENERGY PROJECT

	*ICR**	*ICR Review*	*PPAR*
Outcome	Unsatisfactory	Unsatisfactory	Moderately Satisfactory
Sustainability	Uncertain	Uncertain	Likely
Institutional Development Impact	Partial	N.A.	Modest
Bank Performance	Unsatisfactory	Unsatisfactory	Unsatisfactory
Borrower Performance	Unsatisfactory	Unsatisfactory	Satisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible operational division of the Bank. The ICR Review and earlier Evaluation Memorandum are intermediate OED products that seek to independently verify the findings of the ICR.

N.A. – not available

Key Staff Responsible

TECHNICAL ASSISTANCE AND REHABILITATION PROJECT

Project	*Task Manager/ Leader*	*Division Chief/ Sector Director*	*Country Director*
Appraisal	Mr. J. Besant-Jones	N.A	N.A
Completion	Mr. Mahesh Sharma	Mr. Jeffrey Racki	N.A

URBAN HOUSEHOLD ENERGY PROJECT

Project	*Task Manager/ Leader*	*Division Chief/ Sector Director*	*Country Director*
Appraisal	N.A	N.A	N.A
Completion	Ms. Yuriko Sakairi	Mr. Mark Tomlinson	Ms. Phyllis Pomerantz

Preface

This is a Project Performance Assessment Report (PPAR) on the Energy Technical Assistance and Rehabilitation Project and the Urban Household Energy Project. The former project was approved for a credit of US$20.0 million equivalent in May 1987. The project's closing date of December 31, 1992 was extended two years to December 31, 1994, at which time about US$1.5 million equivalent was cancelled. The Urban Household Energy Project was approved for a credit of US$22.0 million equivalent in June 1989. The project's closing date of December 31, 1996 was extended two years to December 31, 1998, at which time US$2.3 million equivalent was cancelled.

Cofinancing of the Energy Technical Assistance and Rehabilitation project was provided by the Norwegian Agency for Development Cooperation (NORAD). Cofinancing of the Urban Household Energy Project was provided by the Nordic Development Fund (NDF) and the Arab Bank for Economic Development in Africa (BADEA).

The two projects were selected for an OED assessment in order to look more carefully at the performance and sustainability of projects implemented under civil war conditions, and also to include in the overall PPAR portfolio some projects where there has been a substantial duration between project closing and the PPAR. Moreover, they provide useful lessons that could inform the ongoing Energy Reform and Access Project (approved on August 19, 2003) — an Adaptable Program Loan that is the first phase of the Energy Reform and Access Program for Mozambique.

For the Energy Technical Assistance and Rehabilitation project, the report is based on the Implementation Completion Report (Report No. 14734), issued June 28, 1995; the Staff Appraisal Report (Report No. 6647-MOZ) dated May 1, 1987; loan documents, project files and discussions with Bank staff. For the Urban Household Energy Project, the report is based on the Implementation Completion Report (Report no. 19449), issued June 17, 1999; the Staff Appraisal Report (Report No. 7611-MOZ), dated May 12, 1989; loan documents, project files and discussions with Bank staff. An Operations Evaluation Department (OED) mission visited Mozambique between January 31 and February 7, 2004. The mission had discussions with government officials of the relevant ministries and agencies, representatives of donors, the major energy companies, and other stakeholders. Their cooperation and assistance is gratefully acknowledged.

Following standard OED practice, the draft assessment report was sent to the Borrower for comments before it was finalized. The borrower's comments are attached as Annex B.

Summary

The **Energy Technical Assistance and Rehabilitation Project** was prepared and approved in 1987 in response to the civil conflict in Mozambique. It was realized that, without rehabilitation of the energy infrastructure, energy services would deteriorate even more and that improvements were needed to both the infrastructure and the supply of affordable energy services to support the economic recovery of the country. The project had two objectives: to bring about rapidly a sustained improvement in the supply and distribution of electricity and petroleum products in the main urban areas of Mozambique; and to support economic recovery beyond the short term by helping energy agencies to prepare plans for the sound development of the power, petroleum, and household energy/wood fuels subsectors.

The project's outcome is rated *satisfactory*. Following initial delays, the project was effective in providing short-term improvements. These included funding urgent maintenance and rehabilitation of the power generation, transmission, and distribution system; providing needed transportation equipment to the major energy companies; supporting technical assistance for almost all aspects of management and operations as well as studies on various technical and policy issues. Together, these elements provided the foundation for a more robust energy system in Mozambique. The project's sustainability is rated *likely*, given the project's effectiveness in establishing the foundation for the modernization and restructuring process of the energy companies. The successful maintenance and rehabilitation was also instrumental in ensuring that the energy system did not collapse. The institutional development impact is rated *modest* because the energy companies made only minor improvements to their management and financial systems, which already started from a poor base. The Bank's performance is rated *satisfactory,* as project development and supervision were good. However, the project was complex for the small, qualified staff available in Mozambique. Support to help the borrower meet conditions and various covenants, which were clearly difficult for the borrower, could have been better. The borrower's performance is rated *satisfactory*, with the borrower's active and positive participation in implementation despite difficult war conditions.

The objectives of the **Urban Household Energy Project** (UHEP), approved in 1989, were to quickly enhance supply and significantly reduce energy costs for about 25 percent of households in main urban centers; to continue the institutional and financial strengthening of the principal energy supply companies that was initiated under the Energy Technical Assistance Project; and to slow significantly the deforestation around the urban centers and to improve air quality.

The project's outcome is rated *moderately satisfactory*: while some of the objectives were not completely fulfilled, the project did provide long-term benefits that are setting the energy sector on a strong foundation. Its sustainability is rated *likely* because many of the project's reform components, particularly the energy legislation, are having a positive and lasting impact: the energy markets are opening up to competition, the energy companies have become more financially viable, the number of new electricity customers has increased, and the management of wood fuels improved. The institutional development impact is rated *modest*. The major energy companies have

shown strong improvements but some are still highly dependent on continuing technical assistance. The Biomass Energy Unit was a success during the lifetime of the project and then was disbanded to be replaced by a different, community-based approach. The National Directorate of Energy (DNE) had difficulties coordinating the implementation of the project but came away from it stronger in both policymaking and project implementation. The Bank's performance is rated *unsatisfactory* because it allowed for the project to become far too complex for the borrower to manage. There were also problems with supervision in the middle part of the project, at which time it was restructured twice, first to reflect the 1992 peace settlement and then in 1994 as a result of the cyclone that devastated the country. The borrower's performance is rated *satisfactory* in helping achieve project outcomes despite a most difficult situation of armed conflict combined with project design flaws and capability shortcomings among its local partners.

These projects provide useful lessons for future energy projects and policies in Mozambique and elsewhere:

- The objectives of short-term emergency assistance and medium to long-term institutional development and policy assistance are sufficiently different that they should be treated in separate operations. The benefits of energy sector reform need to be clearly explained to decision-makers, managers of energy companies, opinion leaders and the population as a whole in order to build their ownership and support.
- Care must be given to adapt the scale and complexity of projects to ensure that the borrower has the capacity to both manage the projects and absorb the information and lessons that are derived from them.
- Bank supervision teams need to have the necessary range of expertise to deal effectively with the major project components, such as power sector and biomass energy components.
- Moving a country from a traditional-fuel based energy system to one that provides modern energy services to a significant portion of the population requires a long-term strategy that goes beyond the specifics of any one project.

Gregory K. Ingram
Director-General
Operations Evaluation

Background

1. In 1987, Mozambique required emergency assistance to ensure the availability and reliability of electricity and petroleum products. The country's civil war and lack of significant progress in the energy sector since independence in 1975 meant that the sector infrastructure was in a poor condition. A Bank-financed sector assessment study, *Mozambique: Issues and Options in the Energy Sector* (January 1987), stated that rehabilitating existing energy sector assets and institutions was a priority. The prices of commercial energy were well below the economic cost of meeting demand and the prices for various energy products were inequitable: traditional fuels used by the poor were much more costly than the commercial fuels used by the relatively better off households (though the availability of commercial fuels was erratic). Mozambique was relatively well endowed with energy resources and the long-term economic prospects were good once peace was restored to the country. The *Issues and Options* study highlighted that economic recovery would be adversely affected if energy supply systems were not in better condition.

2. Mozambique became a member of the International Monetary Fund and the World Bank in 1985. The first IDA credit financed part of the government's 1985-86 program of imports of equipment, spare parts, and raw materials, as well as related technical assistance for industry, transport, and agriculture.

3. Mozambique's then existing energy system was not sustainable. The country was heavily dependent on biomass fuels; the availability of petroleum products was limited and very expensive; and distribution networks were poorly developed. During the civil war, the urban areas, which now have about one-third of the total population, were virtually cut off from the rest of the country. This resulted in severe deforestation near the urban areas. Furthermore, a very small percentage of the population had access to electricity, and even then only with frequent electricity blackouts due to sabotage of the distribution network. The civil conflict also disrupted transportation routes of coal and petroleum products.

4. It was in this context that the World Bank was asked for assistance. The Energy Technical Assistance and Rehabilitation Project was the second IDA operation in Mozambique and the first totally dedicated to the energy sector. The Urban Household Energy Project (UHEP) was IDA's second lending operation in the energy sector of Mozambique. Together the projects were to help rehabilitate the energy sector infrastructure, help the urban areas recover from the impacts of the war, and improve energy availability for the low-income population

5. In 2003, Mozambique had a population of 18.9 million, up from about 14 million when the project started. It is one of the poorest countries with a gross national income per capita of $210 in 2002. In 2003, it ranked 170 out of 175 in the United Nation's Development Program's Human Development Index. Energy consumption per capita is about two-thirds the average in all Africa and electricity consumption per capita is about half the African average.

6. The country has an area of 802,000 square kilometers, about the size of Germany and Sweden combined. The transport network is poorly developed, in large part because of the long distances and the relatively small population density.

7. The main energy companies, Electricidade de Moçambique (EDM) and Petróleos de Moçambique, SARL (Petromoc), are state owned. At the beginning of the Bank-financed projects, EDM was integrating the country's three electric utilities (one for each region) into a single system. The first IDA lending operation was designed to provide some of the emergency technical assistance and rehabilitation to the energy infrastructure. The Energy Technical Assistance and Rehabilitation Project was designed to build on that first credit. Unfortunately, the first credit was delayed by about two years and the two projects were implemented in tandem more than expected.

8. Now, Mozambique is showing strong improvements. Annual GDP growth is strong – about 7 percent per year. Progress is being made and a new IDA credit, focusing on electricity, is starting in 2004. The Energy Reform and Access Project (approved on August 19, 2003), an Adaptable Program Credit, is the first phase of the Energy Reform and Access Program for Mozambique.

The Projects

Project Objectives

9. The **Energy Technical Assistance and Rehabilitation Project** had two objectives. First, the project sought to bring about a rapid and sustained improvement in the supply and distribution of electricity and petroleum products in the main urban areas of Mozambique. The second objective was to support economic recovery beyond the short-term by helping energy agencies to prepare plans for the sound development of the power, petroleum, and household energy/wood fuels subsectors.

10. The **Urban Household Energy Project** had three main objectives. The first objective was to quickly enhance supply and significantly reduce energy costs for about 25 percent of households in main urban centers, particularly Maputo, Beira, Nampula, Nacala, and Quelimane. The second objective was to continue the institutional and financial strengthening of the principal energy supply companies that were initiated under the Energy Technical Assistance Project. The third objective was to significantly slow the deforestation around the urban centers and to improve air quality.

Project Costs and Financing

11. For the Energy Technical Assistance and Rehabilitation Project, about US$20.1 million equivalent were disbursed and US$1.5 million equivalent were cancelled at the

time of the project's closing (see project costs in Annex A).[1] Almost half of the funding was for technical assistance for the major energy companies, particularly EDM. Funding was also provided for maintenance and rehabilitation of the power generation, transmission, and distribution facilities and the petroleum product distribution system. There was also support for connecting 4,150 households to the grid and for the purchase of urgently needed transportation equipment for EDM and Petromoc. What was not initially expected was financing for the Lithuli Building, which was used to house the expatriate experts.

12. Financing was primarily from the disbursed IDA credit of US$20.1 million equivalent. Cofinancing amounting to US$ 5.0 million equivalent was provided by the Norwegian Agency for Development Cooperation (NORAD). The credit was extended three times, and it closed two years after the original closing date.

13. For the Urban Household Energy Project, funding from the disbursed IDA credit of US$20.35 million equivalent was for rehabilitation, reinforcement, and extension of the power distribution system in Maputo and eight other cities; loans for wiring houses to connect to the distribution system; the provision of stoves, lamps, and electric bulbs; reinforcement of the kerosene and LPG storage and distribution facilities; rehabilitation of the cable factor and a wood fuel utilization program. Financing was also provided for technical assistance, institutional support, and policy support.

14. IDA financed almost half of the project. Cofinancing was provided by the Nordic Development Fund and the Arab Bank for Economic Development in Africa (BADEA). BADEA funds did not become available until late 1994 due to EDM's delay in meeting effectiveness conditions. The credit was closed in April 1998 after two extensions, at which time US$2.3 million equivalent of undisbursed amounts were cancelled.

Implementation Arrangements

15. The Energy Technical Assistance and Rehabilitation Project was implemented through multiple institutions: Electricidade de Moçambique (EDM), Empresa Nacional Petroleos de Moçambique (Petromoc), Empressa de Hirocarbonetos (ENH), and the Ministry of Industry and Energy (MIE).

16. Project coordination for UHEP was the responsibility of the National Directorate of Energy (DNE), supported by the Ministry of Mineral Resources and Energy (MMRE).[2] The various components of the project included many other organizations. For the electricity component, organizations included EDM, the Prolec unit of DNE, and a bank, Banco Popular de Desenvolvimento (BPD). For the petroleum component Petromoc was

1. The Staff Appraisal Report indicates an IDA Credit amount of US$20 million equivalent. Taken together, the amounts disbursed and cancelled at project closing sum up to a total that is greater than the appraised amount due to fluctuations between the US$ and SDR exchange rate. This also applies to the second project in this PPAR.

2. Originally the project was coordinated by the Ministry of Industry and Energy (MIE). In 1994, the energy functions and overall coordination were transferred to the Ministry of Mineral Resources and Energy.

included. For the biomass component, the Ministry of Agriculture was the main organization.

Implementation

Energy Technical Assistance and Rehabilitation Project

17. Implementation of the Energy Technical Assistance and Rehabilitation Project was delayed two years because EDM and Petromoc experienced difficulties in complying with a condition of disbursement for goods and because of a shortage of appropriate accommodation for the long-term expatriate specialists. Both EDM and Petromoc were required to prepare and submit financial statements for the years 1984 to 1987 and to forecast for 1988. Given the poor state of the companies' accounts, the financial statements were not prepared until late 1988. The subsequent delay was due to waiting for the accommodation to be completed. Not until there was accommodation could the specialists be appointed. The project was also affected by sabotage of power transmission lines, which ultimately added to the debt burden of EDM.

18. Implementation was also affected by the ambitious schedule of the project. The agenda included short-term and medium- to long-term needs and there was not enough staff with sufficient qualifications to handle all the tasks. Also linked to the design of the project, was the large scale of the technical assistance (about 1,200 man-months of expatriate support), which placed a significant burden on the qualified staff in Mozambique.

19. Finally, several institutional factors hindered implementation. These included decisions by the GOM over the patrimony of EDM's and Petromoc's assets; a program for clearing inter-enterprise arrears and for adjusting prices of electricity and petroleum products; the need to introduce a compensation scheme earlier in the project cycle to facilitate recruiting and retaining qualified staff; and streamlining the approval process for contracts by government authorities.

Urban Household Energy Project

20. Meeting the effectiveness conditions for the UHEP took 10 months because of the slow administrative procedures in the government. The energy companies, EDM and Petromoc, also delayed the project because of their difficulties in meeting the conditions of credit disbursement, which would have started sooner if the government had facilitated the compliance of these companies. In the SAR it was agreed that EDM would implement a tariff increase in the second half of 1989, that the government would initiate paying off arrears of accounts receivable during 1989, and that EDM's assets would be properly valued with a view to government being able to establish the patrimony and equity of EDM by the end of 1990. The government, which did not recognize depreciation cost to be part of tariffs, was reluctant to increase tariff rates, thus affecting EDM's financial viability. The settlement of arrears was also irregular.

21. The project was restructured in 1994, following a midterm review in 1992, when the armed conflict in the country was resolved. The review was conducted jointly with other donors. Several of the components were modified, although the objectives were unchanged and the project design remained fundamentally the same. Effectively, the target for electrical connections was reduced from 40,000 to 4,000; the financing of imported electricity bulbs was eliminated; the financing of imported stoves, lamps, and solar panels was reduced by 50 percent because they were locally available; the coal program ,which included 50,000 stoves, was eliminated because coal was no longer brought to Maputo after the peace agreement; a decentralized off-grid electrification pilot project of small towns was added; financing of pre-payment electricity meters was added; and a pilot community-managed, natural woodland resource management program was included in 1995 to produce biofuel more efficiently.

22. Following the amended Credit and Project Agreements, Mozambique was hit by a cyclone in March 1994 and the documents were amended again to include in the project a component to cover the rehabilitation needs of the northern power system.

23. The extension of EDM's distribution network was delayed twice. This was because funds from the Arab Bank for Economic Development in Africa (BADEA) did not become available to EDM until late 1994, given EDM's failure to meet effectiveness conditions for the credit. The second delay was because EDM had not met the disbursement conditions for the IDA credit.

Ratings

24. The Energy Technical Assistance and Rehabilitation Project was evaluated more than nine years after the project closed. Consequently, in discussions with Bank projects staff and Mozambique officials, little was remembered about this project or how its results may have been used as a basis for further technical assistance and infrastructure development. This project was designed as emergency support, so normal project indicators were not developed, and the context changed continually throughout the implementation of the project, largely because of achieving peace in 1992.

25. The ICR was quite critical of the UHEP in many respects. The results overall at the end of the project were disappointing, but even then there were positive signs. Plus, the UHEP could not have been implemented under much more difficult conditions: the country was not yet at peace and was still having a difficult time creating a more economically and managerially competent administration, a legacy of gaining independence only in the mid-1970s. Now that the war has been over for more than a decade, the context for assessing the performance of projects in Mozambique has definitely changed.

26. Almost 10 years since project closing, the ratings are also affected by the fact that there have been many other related projects (mainly technical assistance), but it is still possible to piece together the enduring results that are attributable to both these projects.

Energy Technical Assistance and Rehabilitation Project

Outcome

27. **The project's outcome is rated satisfactory**. Following initial delays, the project was effective in providing short-term improvements to the energy supply industries in order to ensure a more stable situation and allow Mozambique to be better prepared for economic recovery. Short-term solutions also require a long-term framework and the technical assistance provided by the project was important in starting the process for the main energy companies to be more financially viable, with better technical capability for the future.

28. Maintenance and rehabilitation of the power generation, transmission, and distribution system did occur, although with some difficulties due to sabotage. Needed transportation equipment for the energy companies was provided. Technical assistance provided by expatriate specialists assisted both EDM and Petromoc in managing a number of areas: engineering, maintenance of transport fleets, aviation fuelling facilities, petroleum product movement, power supply facilities. Further technical assistance was provided for the design and implementation of financial and accounting systems, management information systems, stock control, asset management, and manpower development. Following this technical assistance, EDM, ENH, and Petromoc produced annual financial statements and continue to do so today. Further technical assistance was provided for the design and implementation of financial and accounting systems, management information systems, stock control, asset management, and manpower development. Following this technical assistance, EDM, ENH, and Petromoc produced annual financial statements and continue to do so today.

29. Overall, of the 15 covenants, only six were complied with completely while four were partially fulfilled and two had had substantial delays. Two other covenants related to the financial performance of EDM were not met by the end of the credit but were to be completed in later corporate restructuring.

Relevance

30. **The relevance of the project's objectives is rated substantial.** The project was developed as an emergency aid project to attempt to bring needed infrastructure improvements to the energy supply sector during the civil war. Maintaining and expanding the electricity and petroleum product infrastructure is fully consistent with that context. The project was designed to set the main energy industries on a firmer financial and management footing, which could prepare them for later reforms that were starting to take place in other countries and that would improve the overall functioning of the energy supply industry. The project also provided policy support to allow for the development of more robust, balanced energy policies. These are necessary for the development of sustainable energy strategies.

31. The project is fully consistent with the priorities in the CAS of June 2000 (Report No. 20521 MOZ). These priorities include: (i) maintaining an enabling private sector

environment; (ii) developing infrastructure; and (iii) promoting rural development and agriculture.

32. The specific sectoral targets of the government's Poverty Reduction Strategy Paper are: to ensure that all district capitals and administrative posts are supplied with electricity; and to expand the national grid to connect rural areas. These sectoral targets are to help achieve the Millennium Development Goals of reducing child mortality, improving maternal health, and achieving universal primary education. For this project, there cannot be any direct link with the Millennium Development Goals but it can be argued that the technical assistance and rehabilitation are a necessary condition before the energy sector can be in any position to provide assistance toward these goals.

33. The project is fully consistent with the Bank's objectives as outlined in the Bank's 2001 Energy Business Renewal Strategy. The main priorities for the program include helping the poor directly, improving macroeconomic and fiscal balances (including protecting budgets for social programs that help the poor), promoting good governance and private sector development, and protecting the environment.

Efficacy

34. **The efficacy of the project is rated substantial.** For the most part, the objectives of the project were achieved. The primary objective of the project was to bring about rapidly a sustained improvement in the supply and distribution of electricity and petroleum products in the main urban areas of Mozambique. One major project outcome is that in Maputo alone, 7,376 households were connected to the distribution system between 1990 and 1992, thus contributing to economic recovery up to medium term. Without this emergency support, the energy infrastructure would have deteriorated even more. The energy companies also had some basic needs from vehicles to technical support to rehabilitating existing infrastructure. Another important project outcome was able to provide much of this urgently needed short-term support.

35. Secondarily, the project achieved the objective of providing some technical, analytical, and management assistance, which effectively set the foundation for energy policy development and the better governance of the energy sector. Through technical assistance, the project made important headway assisting both EDM and Petromoc in managing a number of areas: engineering, maintenance of transport fleets, aviation fuelling facilities, petroleum product movement, and power supply facilities. There were 18 expatriate specialists (12 for EDM and 6 for Petromoc) for this, 4 more than originally planned. It had been hoped that the expatriate staff would be able to double up and train local staff, but this was only partially successful.

36. The project also yielded useful outputs related to studies and policy formulation. Least-cost development plans were prepared for EDM and Petromoc. A national urban household energy policy and implementation program was also prepared. A variety of other studies were undertaken, including a study on charcoal production technology, an aerophotographic forest inventory of southern Mozambique, a study of fuel wood supply options, a study of potential for fuel wood plantations, studies on petroleum product

supply and distribution, and a development program for EDM. The fuel wood plantation study, however, was not completed.

Efficiency

37. **Based on the economic and financial rates of return, the efficiency of the project is rated modest.** The original internal economic rate of return (IERR) was estimated at 27 percent, which appears to be reasonable. According to the ICR, this was based on expected quantifiable increases in electricity consumption resulting from improvements in both power and petroleum product supply and distribution. However, the ICR was unable to provide an actual estimate because it felt it was impossible to isolate the investments from other investments in the sector and because sabotage of the electricity grid increased costs without increasing supply and distribution. The ICR concluded that the IERR would be lower than the original estimate. There is no reason to suggest it would be otherwise today.

Institutional Development Impact

38. **The institutional development impact is rated modest.** A major thrust of this project was to support the institutional development of the major energy companies of Mozambique, through various forms of technical assistance, particularly the design and implementation of financial and accounting systems, management information systems, stock control, asset management, manpower development, as well as those related to policy formation. The management systems were very basic at the beginning of the project. For example, annual financial reports had not been prepared before this project and there was no pressure from the government to do so. EDM also argues that its priority was to integrate the three regional companies that merged to become EDM and one of the problems was that each regional company had a different financial management system that affected compatibility. This project was important in assisting the management modernization process as well as helping to consolidate the corporate structure. (EDM does not fully agree with the "modest" rating, pointing out that various management systems for different areas were introduced in EDM in the early 1990s, of which the important ones include: (a) the Project Planning Software, which is reported as having improved considerably the performance of EDM's Engineering Department in preparing product documents for donors; (b) the Stock Control Software, which has facilitated the auditability of EDM's accounts; and (c) the Performance Evaluation System, which has proven useful in staff management.)

Sustainability

39. **The project's sustainability is rated likely.** The technical assistance provided by the project laid the foundation for the future development of the energy sector in Mozambique. The investments made in rehabilitation and expansion were also key to further developing a system of regular maintenance, which is fundamental to long-term sustainability. The technical assistance was designed to help in the restructuring process of the energy companies, which has happened. EDM has continued to receive technical assistance from bilateral donors, such as SIDA, NORAD, BADEA, KfW, Nordic

Development Fund, and the African Development Bank, building on the support provided by the IDA credit. A new IDA credit has been approved and starts in 2004.

40. The technical assistance to support policy development was important because of the need to start developing long-term energy policies. For example, GOM developed a comprehensive strategy for the development of the energy sector, considered by the Council of Ministers in June 1999, aiming at increasing energy exports; promoting competition in the generation and distribution of electricity; increasing access to electricity through the creation of decentralized power markets; increasing the use of commercial forms of energy more in relation to wood fuels; increasing the efficient use of biomass fuels; and strengthening the institutional capacity of the sector entities. The GOM used the results of the IDA-supported project as a foundation for future work. The DNE has developed a good capability in policy analysis and development.

41. The provision of transport equipment was seen as a short-term emergency measure and could not be expected to have a lasting effect.

Bank Performance

42. **The Bank performance is rated satisfactory.** A good analytical base was available for the development of the project and this helped in the project's preparation. One problem in the project design was that there was so much to do, seemingly at once, that the project became very complex and heavily taxed the small group of qualified staff within the energy companies and the government.

43. The ICR raised concerns about the nature of conditionality, administering conditionality, and the composition of supervision missions. Concerning the nature of conditionality, the problem was the lack of data, in the absence of any financial statements, to fully analyze the financial performance of EDM and Petromoc and to assess the adequacy of energy prices to improve the financial prospects of the companies. Without such analysis, covenants were set on a *pro forma* basis, whereas the ICR indicates that an incremental approach to financial performance requirements should have been adopted. On the issue of administering conditionality, no differentiation was made between procedural and substantive covenants, effectively giving equal weight to the two types when substantive covenants were of much greater long-term importance.

44. Concerning the composition of the supervision missions, the ICR was critical that a power engineer was included in only 2 of 18 supervision missions, even though the power sector represented a major component of the project. In this evaluation, there was no possibility of exploring these points since no project staff remain, and the ICR's conclusions have to be accepted.

Borrower Performance

45. **The borrower's performance is rated satisfactory**. Despite the scale and complexity of the project, the borrower was able to produce positive results. The outcome was only partially achieved as the borrower fully complied with only 6 of the 15

covenants. The borrower showed good will and intentions, but the context made it difficult for the borrower to perform any better.

Urban Household Energy Project

Outcome

46. **The project's outcome is rated moderately satisfactory**, based on its ratings of "substantial" for relevance, "substantial" for efficacy, and "modest" for efficiency. The ICR rated the outcome as unsatisfactory, but the assessment mission found that the project had some important positive benefits. As explained below, although the distribution network connections were significantly below targets, performance outcomes ranged from successful to highly successful on the components related to electric meters, liquid fuels distribution, piloting alternative energy, and reforms. Thus, while some of the objectives were not completely achieved, the overall result is positive, with many benefits for the future, including a strong foundation for further energy sector reforms.

47. The most noticeable partial achievement concerns the Prolec component where only 2,500 customers were connected to the distribution network compared to the target of 4,000 (after revision from the original 40,000). This was a complex task, bringing together the electric utility, municipal planning authorities, the lending institution Banco Popular de Desenvolvimento (BPD) and DNE, representing the GOM. The loan programs to help new customers wire their homes and prepare for being connected was not successful in part because the procedures were too complicated and BPD did not have the capacity for such a venture. That should have been known when the project was designed. Many new customers instead wired their homes using their own resources. Another factor for the low level of connections was that municipalities did not prepare urban plans in areas that were targeted for the connections and this prevented new connections in those areas. Another reason was that EDM, which should have been the key player, lacked interest in the component because it was not taking the lead role.

48. The project financed pre-payment electric meters that proved highly successful. By the end of the project 5,000 meters had been installed and a further 15,000 were in the installation stage. By 2004, 50,000 pre-payment meters had been installed.

49. The distribution system for kerosene and LPG throughout the country has been greatly enhanced through the UHEP. Overall, the expansion of the liquid fuels distribution system has worked well. A rural sales network was created providing 200-liter drums, pumps, and trailers through soft loans. While the project provided the equipment, it was not responsible for ensuring that each of the distributors received kerosene supplies. This was not a problem for those who had stores and had supplies come anyway. But for those who did not have regular supplies coming, it often meant having to travel long distances to pick up the kerosene. It is estimated that 50 percent of those who were subsidized during the project are still distributing petroleum products and, given the small dispersed market, this is considered positive. As well, virtually every gasoline filling station has a pump for kerosene.

50. The project also piloted off-grid, decentralized electrification for small villages. Electricity generated by using natural gas from nearby gas fields was supplied to the villages of Vilankulo and Inhassoro. Initially 200 consumers were connected in Vilankulo and 40 in Inhassoro. After nine months, total connections increased to 400.

51. During the project, the Biomass Energy Unit (BEU) was created at the Ministry of Agriculture and several studies were undertaken. This unit, and the analytical base that developed, provided an important foundation for future biomass energy work in Mozambique. A community-based biomass pilot project was implemented southwest of Maputo in 1997. The project was delayed and cut to 10 months from the original 24 months. The project introduced sustainable forest management practices as well as more efficient technology for charcoal production. Efficiency improved 100 percent as a result of the project.

52. EDM, Petromoc, and Moçacor all benefited from reforms introduced under the project and became more financially sustainable. None has a monopoly position anymore. Moçacor is now part of the Portuguese company Petrogal. The company has 7 percent of the liquid fuels market and 78 percent of the LPG market in Mozambique. Its target is to achieve 14-15 percent of the liquid fuels market. Petromoc is functioning well under increased competition. It is more efficient, having reduced its staff significantly. Petromoc is 80 percent state-owned and 20 percent employee-owned. Privatization is continuing and the company is working with the IFC to develop a privatization strategy.

53. Under the project, technical support led to the adoption of the Petroleum Law liberalized the petroleum sector, opening the market to greater competition. For example, in 1990, Petromoc had 83 percent of the liquid fuels market and it is down to 39 percent now.

54. In terms of policy reforms, the project was instrumental in raising electricity tariffs and having both electricity and petroleum legislation developed and approved. The 1997 Electricity Law created the National Electricity Council (CNELEC), which acts as an arbitrator between the concessionaire and the consumer. There is no independent regulator at this point. The law also took the monopoly position away from EDM for generation.

55. All the covenants, both procedural and substantial, were eventually fulfilled, although several had serious delays that slowed the implementation process. A number of studies that were completed, ranging from financial management support to studies on improved wood stoves, electrification and distribution, restructuring in the petroleum and electricity sectors, integrated energy planning, support for the electricity law, and an LPG study. There was also technical assistance for all components of the project.

Relevance of Objectives

56. **The project's relevance is rated substantial.** The project was designed to help the urban areas develop a more balanced, long-term, and cost-effective approach to energy supply. The project helped restructure the main energy companies in order to encourage greater competition and more stable energy supplies at lower cost. The project

was also designed to increase the access to electricity through connecting more households to the distribution systems.

57. The project is fully consistent with the priorities in the Country Assistance Strategy of June 2000 (Report No. 20521 MOZ). These priorities include: maintaining an enabling private sector environment; (ii) developing infrastructure; and (iii) promoting rural development and agriculture.

58. The specific sectoral targets of the government's Poverty Reduction Strategy Paper are to: ensure that all district capitals and administrative posts are supplied with electricity; and to expand the national grid to connect rural areas. These sectoral targets are to help the Millennium Development Goals of reducing child mortality, improving maternal health, and achieving universal primary education. For this project, the link with the Millennium Development Goals mainly concerns access to electricity and modern energy, which will have an impact on health, education, and other targets.

59. The project is fully consistent with the Bank's objectives as outlined in its Energy Business Renewal Strategy. The strategy's main priorities are to help the poor directly, improve macroeconomic and fiscal balances including protecting budgets for social programs that help the poor, promote good governance and private sector development and protect the environment.

Efficacy

60. **The project's efficacy is rated substantial**, based on the achievement of the project's most important objectives.

61. In terms of bringing low-cost commercial fuels to a large number of households, the results were mixed but overall fairly good. The distribution infrastructure for liquid fuels has improved and the increased competition has helped to bring the price down. The pilot village electrification schemes were successful and more such schemes have been implemented since this project. However, the new electricity connections during the project were below expectations (only about 2,500) even after the mid-term review.

62. The capability and viability of government agencies and major energy companies were strengthened. EDM, Moçacor and Petromoc have been substantially strengthened managerially and financially. Management systems have improved. This includes financial management and human resource management. There is significantly more training available, for example. The three companies are exposed to greater competition and this has obliged them to become more efficient. In the electricity sector, the project financed prepayment meters, which ensured that EDM would minimize the non-payment problem. By the end of the project 5,000 electric meters had been installed and a further 15,000 were in the installation stage. This process has continued and by 2004, 50,000 prepayment meters had been installed.

63. The third major objective concerns slowing deforestation around urban areas and helping to alleviate poverty through lower cost of fuel, developing indigenous fuels, and improving the institutional support. The Biomass Energy Unit was created under this

project to both help forestry management and to help support the deployment of more efficient stoves and appliances. Many studies were conducted on charcoal production technology, aerophotographic forest inventory of the region near Maputo, and fuel wood supply options. The project ended before everything was on a firm foundation and the Biomass Energy Unit was disbanded soon after the project closed. However, a more community-based management approach, which was starting to take shape at the end of the UHEP project, has moved forward through two subsequent projects. The current one is being funded by the FAO.

64. The switch by urban populations to lower-cost petroleum products did not occur as expected since petroleum prices are still out of reach of most of the poor. While cheaper on an energy-equivalent basis, people are required to buy and store minimum quantities of kerosene or LPG. With wood or charcoal, they can buy intermittently based on what their cash flow can bear, even though it is essentially more expensive.

65. Deforestation is still a problem. There are some plantations around Maputo and other urban areas that are important. However, in many cases, the wood needed in urban areas is coming from farther distances.

Efficiency

66. **Based on the economic and financial rates of return, the efficiency of the project is rated modest.** The ICR stated that because of changes in the project components from the SAR, that no ex-post ERR on the project as a whole was possible. The main change that would affect the analysis was reducing the target for urban household electric connections from 40,000 to 4,000 and then only achieving about 2,500. The original ERR from the SAR was 50 percent. It appears that the original estimate was overly optimistic given the capacity of the GOM to manage the project, the role of EDM and the capacity of the Banco Popular de Desenvolvimento to provide loans.

67. For the investment in small-rown electrification, the ICR did calculate an ex-post ERR of 11 percent. There is no reason to change this estimate. Some villages were electrified but the demand for electricity remains low. The price of electricity in decentralized off-grid areas is not subject to the national electricity price, which is uniform throughout the country and is generally higher than the national tariff.

Institutional Development Impact

68. **The institutional development impact is rated modest.** This project has contributed to the institutional development of the energy sector. The energy companies — EDM, Petromoc, and Moçacor — have improved financially and managerially. Petromoc and Moçacor are much more effective than they were previously because of the technical assistance they have received and the rigors of the competitive liquid fuels market. But this market is small and there are no signs that it will grow significantly in the short to medium-term. Fundamentally, Mozambique is a poor country and the market for liquid fuels is not developing rapidly. EDM has made improvements but they have been slow in coming and the company has continued to rely on technical assistance. The company still has the mentality of a monopoly position, but it is difficult to blame EDM.

There are many factors at play, including the difficulty in creating a competitive electricity market and the reality is that competition will be minimal. There is separation of accounts between generation, transmission, and distribution functions and that is a positive step in the restructuring process. EDM has created a national transmission department that could eventually be transformed into a separate company. Competitors are free to go into regions where EDM is not present, which is acceptable to EDM officials as they believe those regions are low-potential areas.

69. At the end of the project, the BEU was disbanded, replaced by a community-based management unit. The forestry engineers who used to work in the BEU now mainly work in the provinces and many believe that to be a better approach. The current work is funded by the Dutch and the FAO through a five-year forestry development program. Phase two, funded by the FAO, started in 2003. The project includes local participation. The community-based management approach built on the lessons learned from the BEU and institutionally is on a reasonably sound foundation.

70. The project was complex for DNE to manage. Given all the difficulties in implementing the project, the organization matured well. This has provided long-term benefits to policymaking and project management that are still evident today.

Sustainability

71. **The project's overall sustainability is rated as likely.** Many elements of the project are sustainable, most particularly the legislative framework for electricity and petroleum, which has already had a positive impact, for example, on the development of the liquid fuels markets for kerosene and LPG. The transmission of electricity is still a monopoly, but power generation has been opened up to private investments. There will be further restructuring using these laws as the base.

72. While the initial increase in the number of electricity consumers was disappointing during this project, improvements have taken place as a result of project activities. The use of prepayment meters funded through the credit have now expanded to 50,000 and will continue to grow according to EDM officials. The meters are being used by about 20 percent of EDM customers. Today, EDM is connecting about 25,000 a year and there are about 230,000 customers in total. Between 1997 and 2000, billed electricity increased from 779.2 gigawatt hours to 1013 gigawatt hours.[3] The big problem for EDM is expanding the network. EDM is planning to spend $300 million over the next five years for rural electrification. Most of the money is coming from a variety of foreign sources. Five years ago total electricity losses were in the range of 35-40 percent. Now they are down to 23-24 percent and the company has plans to reduce them further.

73. Improving the capacity of the energy companies is important for their long-term sustainability. EDM has two training centres in Maputo and in the central region, and there are several in-house programs. Engineering and financial training at the senior level, which must be done abroad, has been coordinated with donors to ensure that training is provided for engineers and other highly qualified personnel under donor-

3. EDM Brochure, *25 Anos*, 1977-2002.

funded projects. A large number of managers, economists, engineers and other staff have benefited from overseas training under bilateral cooperation programs with SIDA, NORAD, Electricidade de Portugal, and others. Petromoc also has started a training program. It has a human resources program that provides scholarships to staff to complete university degrees. Since 2002, it has provided about 20 scholarships.

74. The financial and technical/management viability of the energy companies is improving in part due to this project and in part due to further technical assistance from bilateral donors. It will be further enhanced by a new IDA credit. EDM states that the price of electricity is still below the real cost but it is primarily a government decision to change prices. There are some basic rules for raising prices, but they are very complicated to implement. EDM is also concerned about non-payments, which it is obligated to make good. This is effectively a double penalty for the company and, effectively, a motivator to minimize non-payment.

75. The biomass energy program is sustainable now, although it is debatable how much of this is attributable to the UHEP project. Undoubtedly, the project was responsible for building up the capacity within the BEU and in the local university that undertook most of the related studies for the project. The BEU closed soon after the end of the project. The project had created expectations of continuing resources for a long-term program, but the closing of the project caused the operational money to end. Even before the end of the project and the closing of the BEU, the new government in 1995 was evolving its forestry policy approach to a more community-based management of forests. A community-based approach required a long-term commitment and the UHEP was almost at an end. The new approach was later funded by other donors and it continues today. Nevertheless, the new approach was based on the capacity developed through and the lessons of the UHEP.

76. Switching from wood to liquid fuels has not proven completely successful. The infrastructure for liquid fuels distribution is there and will have long-term benefits. However, with price increases, people have switched back to wood and charcoal even if they are more expensive. They can buy coal and charcoal in very small quantities, according to what money they have available. It is an advantage to individuals but not to the country as a whole because it is more costly for the latter. The environmental implications of either option are probably minimal if better forestry management is in place and more efficient stoves are used.

Bank Performance

77. **Bank performance is rated unsatisfactory.** There were several problems with the Bank performance. First, the project design was too complex; it included too many organizations, and EDM was not given enough of a central role (e.g., in Prolec) to make it more invested in the project's success.

78. Supervision was a problem during parts of the implementation phase, especially in the early 1990s when there was frequent turnover of Bank staff. This affected the continuity of the project, particularly at a time when peace had been restored and the project was being redefined. The biomass component certainly could have benefited from

better, specialized supervision to avoid – or at least minimize – the problems that occurred at the end of the project and the complete revamping of the approach taken afterwards. Bank performance in the latter years of the project improved greatly, ensuring that the legislative elements, for one, were achieved.

Borrower Performance

79. **Borrower performance is rated satisfactory.** The ICR rated the borrower's performance unsatisfactory and a case can be made for that. However, it is the view of this evaluation that the borrower's seemingly poor performance was due in large part to the design of the project, the complexity of which exceeded the capability of the borrower. The various elements required a level of coordination and cooperation among various partners that never fully developed. For example, EDM did not accept its role in the Prolec component that was managed by DNE. Although inter-agency cooperation was weak, each individual agency's level of participation in the project was good.

80. The main problem comes down to design of the project. Although the design is obviously a joint effort between the Bank and the borrower, the borrower did not have the experience or capacity to realize that the project was more than it was capable of handling. From the borrower's perspective, there was a war and the borrower wanted to do everything possible to insulate the energy system from the war's negative impacts.

81. The borrower has to be faulted by the delays in meeting the substantial covenants and for partial compliance at best at project closing. It is hard to recreate the context at the beginning of the project to understand the government's reluctance to facilitate the meeting of the financial covenants. At the time, the roles of the government and the state energy companies were poorly delineated and the state energy companies had very poor management systems in place. The Energy Technical Assistance and Rehabilitation Project, which was to help in the modernization of management and financial systems for these companies, was still underway.

82. Essentially, after initial delays and failures, many of the partners developed no sense of ownership in the project and its aims. They became passive instead of active participants. The project was too complex for the small but good staff that was available at DNE, which was coordinating the entire project. This was a major undertaking for the organization and the Prolec program involved good cooperation with EDM and the Banco Popular de Desenvolvimento. DNE did not have the necessary capacity to bring all partners together adequately and that again, in part, was a function of the project design. This should have been foreseen during the project design stage.

Findings, Lessons Learned, and Outlook

Major Findings

83. The Energy Technical Assistance and Rehabilitation Project was an emergency operation and has to be seen in that context since most of the implementation period

occurred before peace was achieved. Implementation was never going to be easy and this was exacerbated by delays to the beginning of the project because of lack of housing for expatriate staff. This indicates the poor condition that Maputo, and Mozambique as a whole, was in. While not described as an emergency operation, the UHEP followed soon after the first project and was affected by the difficulties of operating in a post-conflict country. Also, the UHEP was designed to help urban areas, which were least affected directly by the civil unrest but were forced to change their energy habits because of the war. The urban area, like the rest of the country, is highly dependent on wood for fuel. Because of the dangers involved in venturing too far away from the urban areas during the war, there was widespread deforestation closer to them. The project was designed to increase wood supply, improve the efficiency of wood and charcoal use, increase the availability of affordable liquid fuels, and to increase the penetration of electricity to new customers. To do so, a number of reforms were also required. These included improving the financial and managerial capability of the main energy companies and increasing competition in order to lower costs of supply. This required some legislative actions.

84. Together the two projects provided some building blocks for developing a sound energy infrastructure and balanced energy policy. Both projects provided significant technical assistance to the energy companies and both provided support for getting those companies on a sound financial and management foundation.

85. The UHEP, in particular, moved beyond the energy infrastructure into policy development and program management. These are not easy for any country but were particularly difficult for Mozambique where there was limited human and financial capacity and little tradition in policy development and project management. It has been argued by Paul Stern[4] and others that energy policies have to be seen as experiments because even with the best planning one can still never be certain of the outcome. This is definitely the case with the Prolec component of the UHEP, but can be equally true for other elements of the projects.

86. Overall, the technical assistance has proven very important. The most important part of the legacy appears to be the annual preparation of the financial situation of the energy companies, which continues today. One of the faults of the technical assistance was that there was too much to manage and absorb in a short period of time for a small group of officials. While it is important to be ambitious, there are limitations. The staff of the energy companies and the DNE is good but it is still not large. The company has an in-house training program and some engineering and financial training at the senior level is undertaken abroad.

87. Both projects provided needed assistance to EDM and Petromoc in particular, but also to other energy players. In the petroleum area, the market is functioning quite well and there is good competition. The problem is that the market is so small and this makes it difficult to invest in the regions where there is little demand and that is unlikely to change in the foreseeable future.

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4. Paul Stern and Elliot Aronson, editors, *Energy Use: The Human Dimension*, Washington, National Research Council, 1984.

88. Today, the staff of these organizations is better equipped to manage the companies. Nearly all EDM staff are now Mozambican and about 6% hold university degrees.

89. One issue that came up repeatedly during the assessment mission was energy as a public service. Both EDM and Petromoc officials expressed their public service obligations to provide energy throughout the country and at prices they do not necessarily have full control over. EDM indicated that the price of electricity was below its real cost and that it was obliged to electrify some villages even though it was not in the company's interest to do so. It is a delicate balancing act between providing (subsidized) public service and energy sector reform that has to be monitored carefully, especially in the context of achieving poverty reduction goals.

90. Although these projects had good objectives, they were too ambitious and too complex, given the human capacity within the administration and energy companies as well as the context of civil war. The war ended during the implementation of the Energy Technical Assistance and Rehabilitation Project and, as a result, some changes were made to the project components. These changes responded to some of the implementation problems, but the changes were too little, too late.

Lessons Learned

91. The lessons from the experience of these projects reinforce those of other OED evaluations:

- The objectives of short-term emergency assistance and medium to long-term institutional development and policy assistance are sufficiently different that they should be treated in separate operations. The benefits of energy sector reform need to be better explained to decision-makers, managers of energy companies, opinion leaders and the population as a whole in order to build their ownership and support.
- Care must be given to adapt the scale and complexity of projects to ensure that the borrower has the capacity to both manage the projects and absorb the information and lessons that are derived from them.
- Bank supervision teams need to have the necessary range of expertise to deal effectively with the major project components. This was true for both the power sector component and the biomass energy component of this project.
- Moving a country from a traditional-fuel based energy system to one that provides modern energy services to a significant portion of the population requires a long-term strategy that goes beyond the specifics of any one project.

Outlook

92. For all their shortcomings, the projects were very important, given the circumstances at the start of implementation. Work continues to build on the technical assistance from these projects. There are now projects with Denmark, Norway, and Sweden, in particular. There is also a new IDA credit that recently started that will continue with the development of the electricity system.

93. Mozambique is undergoing major growth and the energy companies are seen as an important component for supporting such growth. Energy access is still very low, yet economic growth is demanding reliable energy supplies. Care needs to be given to ensure that the larger social goals and poverty reduction are not lost in the pressure to provide modern energy to the growing new industries. With the support of these two projects, the policies are in place and overall the outlook for the energy sector is positive.

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Annex A. Basic Data Sheet

ENERGY TECHNICAL ASSISTANCE AND REHABILITATION PROJECT

Key Project Data *(in US$ million equivalent)*

Component	*Appraisal*	*Actual**	*Actual Percentage Share*
Power System Maintenance and Rehabilitation	6.5	2.9	54.3
Transport Equipment for EDM	1.8	1.5	82.3
Petroleum System Maintenance & Rehabilitation	3.1	3.1	118.9
Transport Equipment for Petromoc	3.1	0.6	18.7
Technical Assistance	12.3	10.1	92.4
Lithuli Building	-	0.8	-
Project Preparation Facility	1.1	1.1	100.0
Contingencies and Interest During Construction	3.9	-	-
Total Project Cost	**31.8**	**20.1**	**74.6**

*IDA costs only

Cofinancing *(in US$ million equivalent)*

Source	*Appraisal Estimate*	*Actual*
IDA	20.0	20.1
NORAD	5.0	5.4
GOM and energy companies	6.8	N/A
Total	**31.8**	**25.5***

* Only foreign costs

Cumulative Estimated and Actual Disbursements *(in US$ million equivalent)*

	FY88	*FY89*	*FY90*	*FY91*	*FY92*	*FY93*	*FY94*	*FY95*
Appraisal Estimate	3.1	10.0	12.4	15.9	19.7	20.1	-	-
Actual	2.6	2.6	3.3	6.7	11.9	17.2	18.9	20.1
Actual as % of estimate	83.4	26.0	26.6	42.1	60.4	85.6	94.0	100.0

Project Dates

	Original	*Actual*
Negotiations	January 1987	April 13-17, 1987
Board Presentation	February 1987	May 26, 1987
Effectiveness	October 24, 1987	November 30, 1987
Closing Date	December 31, 1992	December 31, 1994

Staff Inputs (staff weeks)

	Actual No. Staff Weeks	*Actual US$ (000s)*
Pre-appraisal	23.9	N/A
Appraisal	24.7	N/A
Negotiations	5.9	N/A
Supervision	87.1	N/A
Completion	5.2	N/A
Total	146.6	N/A

Mission Data

	Date (month/year)	*No. of persons*	*Specializations represented*	*Performance rating*	
				Implementation status	Development objectives
Appraisal through Board approval	July 1986	4	ECN		
Supervision 1	September 1987	2	ECN, FNA		No 590
Supervision 2	February-March 1988	1	FNA	1	1
Supervision 3	August 1988	1	FNA	1	1
Supervision 4	November 1988	1	FNA	1	1
Supervision 5	April 1989	1	FNA	1	1
Supervision 6	November 1989	2	FNA	2	2
Supervision 7	April-May 1990	2	EGR, FNA		No 590
Supervision 8	October-November 1990	3	EGR, ECN, FNA	2	3
Supervision 9	February-March 1991	1	FNA	2	3
Supervision 10	October 1991	3	EGR, ECN, FNA	2	3
Supervision 11	May 1992	1	ECN		No 590
Supervision 12	August 1992	1	FNA	2	3
Supervision 13	October-November 1992	2	ECN, FNA	2	2
Supervision 14	March 1993	2	FNA		No 590
Supervision 15	July 1993	1	FNA	2	2
Supervisión 16	November-December 1993	1	FNA	2	2
Supervision 17	March-April 1994	1	FNA	2	2
ICR	May 1995	1	ECN		

KEY: EGR=Power Engineer; FNA=Financial Analyst; ECN=Economist; OPN.

URBAN HOUSEHOLD ENERGY PROJECT

Key Project Data *(in US$ million equivalent)*

Component	*Appraisal*	*Actual*	*Actual Percentage Share*
EDM	20.60	16.71	81.1
Petromoc	2.50	6.24	249.6
MOCACOR	0.87	0.33	37.9
DOE	9.36	13.14	140.4
Prolec	11.61	5.20	44.8
Commercial Energy Program	4.37	0.30	6.9
Fuel Imports	30.0	0.0	0
Interest During Construction	1.49	0.69	46.3
Total Project Cost	80.8	42.61	52.7

Cofinancing *(in US$ million equivalent)*

Source	*Appraisal Estimate*	*Actual*
IDA	22.0	20.35
Government of Denmark	3.0	0.0
Badea	10.0	8.19
Nordic Development Fund	5.70	5.55
Moz. Companies	8.90	3.08
GOM	1.20	5.43
Total Project Finance	50.80	42.61
Commodity Aid Funds by SIDA, Norad and IDA	30.0	N/A
Total	80.80	N/A

Cumulative Estimated and Actual Disbursements *(in US$ million equivalent)*

	FY90	*FY91*	*FY92*	*FY93*	*FY94*	*FY95*	*FY96*	*FY97*	*FY98*
Appraisal Estimate	3.8	5.9	10.8	14.8	18.3	20.6	21.8	22.0	-
Revised	3.2	3.2	5.2	6.6	8.8	10.7	13.0	16.9	22.0
Actual	3.2	3.2	5.2	6.6	8.8	10.7	13.0	15.0	20.4
Actual as % of estimate	84	54	48	45	48	52	60	68	-

Project Dates

	Original	*Actual*
Negotiations	February 1989	April 1989
Board Presentation	March 1989	June 1989
Effectiveness	December 1989	April 1990
Closing Date	December 31, 1996	April 30, 1998

Staff Inputs (staff weeks)

	Actual No. Staff Weeks	*Actual US$ (000s)*
Preparation and Appraisal	41	90
Appraisal to the Board	6	14
Board to Effectiveness	12	34
Supervision	158	518
Completion	229	799
Total	446	1455

Mission Data

	Date (month/year)	*No. of persons*	*Specializations represented*	*Performance rating*	
				Implementation status	Development objectives
Supervision 1	November 1989	2	FA	S	S
Supervision 2	May 1990	3	FA, PE, RE	S	S
Supervision 3	November 1990	3	FA, EC, RE	S	S
Supervision 4	March 1991	1	FA	S	S
Supervision 5	October 1991	3	FA, PtE, EC	US	S
Supervision 6	August 1992	1	FA	US	S
Supervision 7	November 1992	2	FA, EC	US	S
Supervision 8	March 1993	2	FA	S	S
Supervision 9	July 1993	1	FA	S	S
Supervision 10	December 1993	1	FA	S	S
Supervision 11	April 1994	1	FA	S	S
Supervision 12	December 1994	2	FA, EC	S	S
Supervision 13	June 1995	4	FA, EC, PtE, PE	S	S
Supervision 14	November 1995	4	FA, EC, PE, RE	S	S
Supervision 15	March 1996	3	FA, EC, PE	S	S
Supervisión 16	October 1996	3	FA, EC, PE	S	S
Supervision 17	June 1997	3	FA,. EC, RE	S	S
Supervision 18	February 1998	2	EC, RE	S	S
ICR	May 1998	3	FA, EC, RE	S	S

KEY: FA=Financial Analyst; EC=Economist; PE=Power Engineer; PtE=Petroleum Engineer; RE=Renewable Energy Specialist.

Performance Rating: S=Satisfactory; US=Unsatisfactory.

Annex B. Borrower Comments

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Conselho de Administração

ELECTRICIDADE DE MOÇAMBIQUE, E.P.
Av. Agostinho Neto 70 • 8º Andar
Fax 49 10 48 • Tel 49 06 36
Caixa Postal 2447 Maputo Moçambique

To

World Bank
Operations Evaluation Department
Att: Mr. Alain Barbu

Washington DC – U.S.A.

Nossa referência	Vossa Comunicação de	Data
143/CA/2004		06/09/2004

Assunto: Re. Mozambique – Energy Technical Assistance and Rehabilitation Project (Credit 1806 – MZ)
Urban Household Energy Project (Credit 2033 – MZ)
Comments to the Performance Assessment Report

Dear Sir,

We refer to your Draft Project Performance Assessment Report submitted to us for comments on August 18, 2004.

As such, pleased find bellow the comments we are pleased to submit to you:

1. In paragraph (24), page (5), it states that the Mozambique officials did not remember anything about the project and virtually no one that worked on the project was around. We would like to mention that most of the former coordinators of the EDM components for both projects are still around and they would have given their contribution to the mission if we were required to make them available;

2. In paragraph (38), page (8), we would not agree completely with the rating. Our point of view is that the Institutional Development of EDM has comprehended an impact much more significant compared to the one described in the report. In fact, various management systems for different areas were introduced in EDM in the early 90's. Following are some examples introduced between late 80's and early 90's: i) The Project Planning Software, which has improved considerably the performance of our Engineering Department at preparing the project documents for the Donors; ii) the

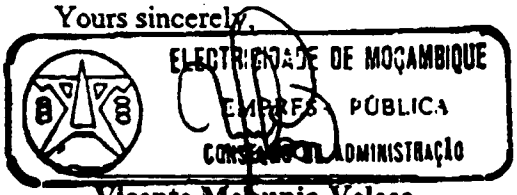
Stock Control Software which has helped the accounts of EDM to become auditable; iii) the Performance Evaluation System which has serving as an extremely useful instrument for staff management; and others;

3. In paragraph (39), page (8), we would only like to add NORAD, NDF, BADEA, KFW, BAD to Donors continuing to deliver important Technical Assistance to EDM;

4. In paragraph (73) we have two notes: i) Apart from the training centre of Maputo, EDM has one more training centre in the central region, at Chimoio city, ii) of course most of the training courses for engineering and financial at the senior level do take place abroad. What is not completely true in the report is the difficulty to implement it. In fact, EDM has always managed to coordinate with Donors and to ensure training programs for engineers and other high qualified personnel involved in projects funded by various Donors over the years. A large number of different high qualified senior staff including Managers, Economists, Engineers and others have benefited from oversea training over the years under bilateral cooperation with SIDA, NORAD, EDP from Portugal and others;

5. The paragraph (88) states that EDM is today heavily dependant on expatriate staff, which is not an updated picture. This is the situation the EDM used to be in the past. The real situation for today is completely different, the whole 100% of personnel are Mozambican and about 6% of which are qualified and hold university degrees.

Yours sincerely,



Vicente Mebunia Veloso
Chairman of Executive Board