

INTERNATIONAL DEVELOPMENT BANK
UNITED STATES GOVERNMENT

JAMAICA

PROJECT TITLE

ENERGY SECTOR ASSISTANCE

AID/LAC/P-080/1 Supplement

Loan Number 512-016A
Loan Number 512-016B
Project Number 532-005

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT		1. TRANSACTION CODE A A = Add C = Change D = Delete	Amendment Number Two	DOCUMENT CODE 3
I. AMENDED PROJECT DATA SHEET		3. PROJECT NUMBER 532-0065		
2. COUNTRY/ENTITY JAMAICA		5. PROJECT TITLE (maximum 40 characters) Energy Sector Assistance		
4. BUREAU/OFFICE LAC		05		
6. PROJECT ASSISTANCE COMPLETION DATE (PACD) MM DD YY 09/30/86		7. ESTIMATED DATE OF OBLIGATION (Under "B:" below, enter 1, 2, 3, or 4) A. Initial FY 83 B. Quarter 3 C. Final FY 84		

8. COSTS (\$000 OR EQUIVALENT \$1 = J\$1.78)

A. FUNDING SOURCE	FIRST FY 83			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	4,900	-	4,900	5,900		5,900
(Grant)	()	()	()	()	()	()
(Loan)	(4,900)	(-)	(4,900)	(5,900)	()	()
Other U.S.						
1.						
2.						
Host Country	-	2,000	2,000	-	5,600	5,600
Other Donor(s)						
TOTALS	4,900	2,000	6,900	5,900	5,600	11,500

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
		(1) SD	744B		878		7,500		5,900
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)						11. SECONDARY PURPOSE CODE	
876	874	840	720	830	160	NONE	
12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)							
A. Code		TECH					
B. Amount							
13. PROJECT PURPOSE (maximum 480 characters)							

To strengthen the GOJ's institutional capability to plan and manage energy programs, particularly to expand and improve its energy conservation program and to institute programs in alternative energy in the public and private sectors of the economy.

14. SCHEDULED EVALUATIONS				15. SOURCE/ORIGIN OF GOODS AND SERVICES			
Interim	MM YY	MM YY	Final	MM YY	<input type="checkbox"/> 000	<input checked="" type="checkbox"/> 941	<input checked="" type="checkbox"/> Local <input type="checkbox"/> Other (Specify)
	07/84	07/85		07/86			

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a 76 page IP Amendment)

To add back into the project two components that were not authorized along with the rest of the project in 1981. AID/W postponed the authorization of the two components pending the submission of additional analysis. This analysis has now been completed and is presented in this Project Paper Supplement.

17. APPROVED BY	Signature	Date Signed MM DD YY 06/16/83	18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION MM DD YY
	Title		

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON D C 20523

ASSISTANT
ADMINISTRATOR

PROJECT AUTHORIZATION

Name of Country : Jamaica
Name of Project : Energy Sector Assistance
Number of Project: 532-0065
Number of Loan : 532-W-016 A (Phase I)
532-W-016 B (Phase II)

Pursuant to Section 106 of the Foreign Assistance Act of 1961, as amended, the Energy Sector Assistance project for Jamaica was authorized on August 27, 1981 (the "Authorization"). That Authorization is hereby amended by the addition of the following:

1. Pursuant to Section 106 of the Foreign Assistance Act of 1961, as amended, I hereby authorize Phase II of the Energy Sector Assistance project for Jamaica, involving planned obligations of not to exceed Five Million Nine Hundred Thousand United States Dollars (\$5,900,000) in loan funds ("Loan") over a three year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.
2. Phase II of the project consists of (i) the establishment of an Energy Credit Fund to (a) finance private sector conservation and alternative energy investments and (b) provide loans to local energy-related industries and (ii) the provision of technical assistance to help establish and upgrade local energy-related industries.
3. The Project Loan Agreement for Phase II, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate:

a. Interest Rate and Terms of Repayment

The Government of Jamaica ("GOJ") shall repay the Loan to A.I.D. in U.S. Dollars within twenty (20) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The GOJ shall pay to A.I.D. in U.S. Dollars interest from the date of first disbursement of the Loan at the rate of (i) two percent (2%) per annum during the first ten (10) years, and (ii) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Commodities, Nationality of Services

Commodities financed by A.I.D. under the Loan shall have their source and origin in Jamaica or in countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have Jamaica or countries included in A.I.D. Geographic Code 941 as their place of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Loan shall be financed only on flag vessels of Jamaica or countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing.

c. Conditions Precedent to Initial Disbursement

Prior to any disbursement, or to the issuance of any commitment documents under the Project Agreement, the GOJ shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D.:

(i) Evidence that the GOJ has appointed a Project Officer at the Ministry of Mining and Energy to coordinate the project with a counterpart from the National Development Bank ("NDB").

(ii) Evidence that the GOJ has deposited the first tranche of its contribution to the Energy Credit Fund, which tranche shall be no less than 1.0 million U.S. Dollars equivalent in Jamaican currency.

(iii) Evidence that a definitive procedure has been established for the expeditious execution of all necessary authorizations and clearance for the importation of equipment and materials by sub-borrowers from the Energy Credit Fund.

(iv) Evidence that the NDB, in collaboration with the Ministry of Mining and Energy, has established the technical, economic and financial criteria against which sub-loan applications will be judged. This will include the guidelines for undertaking audits (formats, calculations), payback and return on investment ranges and types of projects eligible for funding. In addition, a listing of certified auditors and technical specialists will be prepared for referral through the financial intermediaries to the ultimate beneficiaries.

d. Condition Precedent to the First Disbursement for the Energy Credit Fund

Prior to any disbursement, or to the issuance of any commitment documents under the Project Agreement for the Energy Credit Fund, the GOJ shall, except as A.I.D. may agree in writing, furnish A.I.D., in form and substance satisfactory to A.I.D., evidence that a loan agreement, acceptable to A.I.D., has been executed between the GOJ and the NDB.

e. Condition Precedent to the Disbursement for the Energy Credit Fund in Excess of \$1.6 Million

Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement for the Energy Credit Fund in excess of \$1.6 million, the GOJ shall, except as A.I.D. may otherwise agree in writing, furnish A.I.D., in form and substance satisfactory to A.I.D., (i) evidence that the GOJ has deposited the second tranche of its contribution to the Energy Credit Fund, which second tranche shall be no less than 1.0 million U.S. Dollars equivalent in Jamaican currency; and (ii) evidence that a preliminary evaluation of the Project has been completed.

f. Covenants

The GOJ shall covenant that, unless A.I.D. otherwise agrees in writing, it will:

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(i) Contribute its third tranche to the Energy Credit Fund on or before July 31, 1984, which third tranche shall be no less than 2.0 million U.S. Dollars equivalent in Jamaican currency.

(ii) Contribute its fourth and final tranche to the Energy Credit Fund on or before November 30, 1984, which tranche will, at the time, bring the total GOJ contribution up to its committed contribution level of 5.0 million U.S. Dollars equivalent in Jamaican currency.

(iii) Exercise its best efforts to maintain a reasonable ratio of U.S. dollars to Jamaican dollars in the Energy Credit Fund.

Markus Brown

Acting Assistant Administrator
Bureau for Latin America and the
Caribbean

7/27/83

Date

Clearances:

GC/LAC: RBMeighan	<i>RH/GC</i>	Date	<i>7/21</i>
LAC/CAR: RDelaney	<i>RD</i>	Date	<i>7/27</i>
LAC/DR: DBJohnson	<i>DB</i>	Date	<i>7/27/83</i>
LAC/DR: WStickel	<i>W</i>	Date	<i>7/27</i>

GC/LAC: *GM* Inter: atb: 7/18/83: 632-9241: 0043N

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JAMAICA ENERGY SECTOR ASSISTANCE

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(532-0065)

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V. SUMMARY AND RECOMMENDATIONS

A. Recommendation

That a loan be authorized to the Government of Jamaica in the amount of \$5,900,000 (five million nine hundred thousand dollars), with a 20-year term including a 10-year grace period, and at 2 percent interest during the grace period and 3 percent interest thereafter.

B. Borrower and Implementing Agency

The Borrower will be the Government of Jamaica. The major implementing agency will be the National Development Bank (NDB) of Jamaica which will on-lend the funds to selected commercial and merchant banks who will, in turn, on-lend them to the Jamaican private sector to finance energy conservation and alternative energy investments and energy-related industry development. The secondary implementing agency will be Jamaica's Ministry of Mining and Energy, which will provide conservation and alternative energy technical assistance to the financial intermediaries and promote the Project utilizing the facilities and capabilities available at the Public Education Unit, Energy Division, MME.

C. Summary Project Description

This Project Paper supplement is being submitted in order to add back to the project two components that were not authorized along with the rest of the project in 1981. AID/W postponed the authorization of the two components pending the submission of additional analysis. This analysis has now been completed and is presented in this supplement.

The proposed activities are to enhance the GOJ's ability to implement its conservation and alternative energy programs. The private sector is a large consumer of imported petroleum; and since most of its investment in plant and equipment was made before petroleum became expensive, studies show that considerable energy conservation can be accomplished by conducting energy audits at plant sites and implementing the overhauling, retrofitting recommendations of those audits.

Jamaica's severe shortage of foreign exchange is the single most imposing obstacle to economic recovery. The country's dependence on imported energy sources is a major cause of the shortage. Paradoxically, the critical foreign exchange situation that is largely caused by relatively high per-capita energy consumption, makes it exceptionally difficult for the private sector to acquire foreign exchange and local credit to finance energy con-

VI. BACKGROUND: Energy Sector Assistance Project

The Jamaica Energy Sector Assistance Project was designed in early 1981 and submitted to AID/W as a \$14 million package in June of 1981. As a result of project review, a decision was made to divide the project into two phases. Phase I, which deals with GOJ institutional development and public sector conservation and alternative energy activities, was authorized for \$7.5 million in August of 1981 and is currently under implementation. Phase II, (estimated to cost \$5.9 million) which will deal with the establishment of a revolving credit fund to be used to finance private sector energy conservation and alternative energy investments and the establishment and/or upgrading of local energy related industries, was not authorized at that time because certain analysis was lacking. USAID/J was requested, prior to the submission of a Project Paper Supplement for Phase II activities, to (a) undertake an analysis of private sector demand for credit to finance conservation and alternative energy investments (b) determine the appropriate interest rate to be charged to the sub-borrower, (c) establish borrower eligibility criteria and (d) outline procedures for maintaining the monetary value of the revolving credit fund.

This analysis has now been completed. First Washington Associates (FWA) under a \$100,000 contract addressed each of AID/W's concerns. FWA's conclusions and recommendations serve as the basis for this Project Paper Supplement.

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VII. DETAILED PROJECT DESCRIPTION

A. Background

The USAID/GOJ Energy Sector Assistance Phase I Project is designed to create an institutional base for Jamaica to deal with its energy problems in the coming decade. Its particular emphasis is on:

- strengthening the GOJ's institutional capacity to plan and manage energy programs;
- expanding and improving the GOJ's energy conservation program in the public sector; and
- instituting alternate energy programs in the public sector.

Phase I, underway since September 1981, is being implemented by the Ministry of Mining and Energy in cooperation with other government organizations and agencies such as CAST, SRC and PCJ that have responsibility for energy-related activities in Jamaica.

Progress to Date of Phase I Program

Phase I has three major components, each of which is divided into a number of sub-activities. The major components are:

- Program planning and management
- Energy conservation in the public sector
- Alternative energy in the public sector

The progress of the activities under each of these major components is described below:

Program Planning and Management

The primary purpose of this project component is to strengthen the planning and management capability of the Energy Division (ED) of the Ministry of Mining and Energy by increasing the size of the staff, providing short and long term training for staff, development of an Energy Information Center, provision of technical assistance consultants in a variety of fields and limited commodity support.

The Project Implementation Unit (PIU) has been established in the ED, and a Project Director for Phase I has been appointed to implement the project. The staff of the PIU has been increased by 10 with an additional 5 positions remaining to be filled. The contract is in place for technical assistance consultants, and the resident long-term advisor (energy generalist) and the energy conservation specialist have taken their posts.

Two staff members have been sent for post-graduate training in energy economics, and ED staff members participated in two short-term courses on Energy Management and in Energy Planning.

The implementation plan for the Energy Information Center is complete and a number of books and periodicals have been acquired, and procurements processed for necessary equipment and supplies.

Also included in the Program Planning and Management component of the Project is the Economic Planning Branch, which is responsible for drafting alternate strategies so that decision makers can establish the National Energy Plan for Jamaica. In support of this work, the Economic Branch has let out contracts for energy surveys to be carried out in the electricity, tourism, industrial, household, agricultural, commerce, transportation and bauxite/alumina sectors of the economy. These surveys will provide the primary data needed to update the National Energy Plan.

Conservation

The focus of the conservation component is the development of a conservation plan, implementation of a broad-scale public education program, definition and actualization of an auditing and retrofitting program for the public sector, the preparation of an energy conservation manual for the construction industry, and the provision of technical assistance consultants (long and short term) to train staff in the Energy Division.

To date, progress has been realized in all areas. The long term conservation advisor is on board, as well as the recruitment of additional staff.

The Public Education Unit is well underway, in particular, the advertising program, which includes billboards, posters, brochures, leaflets, bulletins, audio-visual materials, radio/television spots, and a regular publication providing information on energy related activities in the country and abroad that are of relevance to Jamaica.

A number of energy audits have been completed by MME staff. Training courses have been undertaken for private contractors, who have also completed a series of energy audits. Three retrofitting programs in the public sector have been started following the completion of ten energy audits.

The contractual agreements and the preparation of the conservation manual are in place. A seminar in the use of the conservation manual was carried out in mid-May 1983 for the benefit of the private contractors, engineers and architects in Jamaica.

Alternative Energy

The purpose of this project component is to provide assistance in support of Jamaica's efforts to develop its alternative sources of energy by: institutional strengthening of the Alternative Energy Branch of the ED, instituting a program for the wide-spread dissemination of opportunities in solar water heating technology, improving the meteorological data base, training solar systems installers, assessing the potential for developing alternative energy resources, establishing a Solar Energy Institute at CAST, and establishing an alternative energy demonstration center in the rural area.

Reasonable progress has been made under this project component. Having completed the initial planning and preparatory work, the implementation of the plan has begun in several areas. The staff augmentation has been identified, and some appointments have been made. Response to tenders have been received for installation of solar water heaters at the hospitals, one teacher's college, one hotel, six health centers, one old people's home and two markets. The necessary equipment for the improvement of the meteorological data base at Jamaica's Meteorological Office has been ordered. The first of 3 training courses for solar installers has been completed. The implementation plan for the CAST Solar Energy Institute has been approved and financial arrangements are being worked out with PCJ for the completion of the Institute. Equipment for experiments is on order.

All in all, Phase I of the Energy Sector Assistance Project has progressed reasonably well and a sound base is in place to start Phase II in the private sector.

B. GOAL AND PURPOSE OF THE PHASE II PROJECT

The goal of the Phase II Energy Sector Assistance Project is to further reduce Jamaica's dependence on imported petroleum by tapping energy saving opportunities in the private sector. It is to be achieved through an energy conservation strategy in the industrial and commercial sector and through the concomitant increase in the energy supply contribution from alternative energy resources in the private sector.

The overall purpose of the energy sector assistance project is to strengthen Jamaica's institutional capacity to plan and manage energy programs directed at improving its energy situation, including expanding and improving the GOJ's energy conservation program and instituting programs in alternative energy. Phase I of the project focuses on public sector activities. It has served to lay the groundwork for and demonstrate the viability of the conservation measures and alternate energy technologies. The purpose of Phase II is to further reduce Jamaica's dependence on imported fuels by providing funds for private businesses and

industries to retrofit their facilities and to assist local energy related industries.

The purpose will be achieved by the establishment of a Energy Credit Fund (ECF) to finance local and foreign exchange costs for energy projects in conservation, alternative energy, energy industry development and energy audits. Loans for these projects will be made available to qualified borrowers from commercial banks accredited by the National Development Bank (NDB) to participate in the Fund. Overall responsibility for the ECF will be shared by the Ministry of Mining and Energy and the National Development Bank (NDB).

C. PROJECT DESCRIPTION AND RATIONALE

(i) Project Description

Phase II of the Energy Assistance Project consists of an Energy Credit Fund (ECF) from which eligible borrowers may seek loans to finance energy audits, retrofitting improvements and/or the costs of developing new energy conservation related industry. Eligible borrowers will be private sector firms that can demonstrate credit worthiness and meet security criteria of the financial intermediaries in the program in addition to economic criteria of the National Development Bank (NDB).

The ECF will be established with both a U.S. dollar loan and a local currency loan from the GOJ, and will be administered on behalf of the GOJ by the NDB. The NDB will provide project funds to sub-borrowers through Affiliated Financial Institutions that have met NDB criteria for participation in the program.

In addition, technical assistance will be provided as necessary to support the pursuit of Project Objectives.

(ii) Project Rationale

AID assistance in the energy sector has emphasized general programs for energy conservation and alternative energy systems. Phase I of the Energy Sector Assistance project provides financing for conservation and alternative energy projects in the public sector and for building a cadre of trained personnel in the key areas. The Phase I project also supports a public information program designed to give extensive publicity to various project activities as well as to inform the public at large to the social and economic benefits of energy conservation and alternate energy technologies. The concept of a "credit window", in the form of the Energy Credit Fund, is designed under Phase II which offers the means to make the transition from public awareness and interest to concrete steps to implement appropriate measures, particularly in the private sector.

It should be noted that a survey undertaken by the Jamaica Manufacturers Association and others indicated that the private sector would cooperate and make the necessary capital investment to support efficient energy utilization if appropriate financing were made available. A viable credit window based on reasonable terms and conditions is seen as a first step in the process, since availability of funds has been identified as one of the major constraints to development and expansion of domestic alternate energy industries and private sector investment in energy conservation measures. Capital to finance engineering audits, and retrofitting improvements is an important input to Jamaica's energy program that can pay off with future energy savings - as well as savings of critically short foreign exchange. The process is a systematic procedure requiring a number of inputs to realize the final goal of reducing Jamaica's dependence on imported petroleum. The Energy Credit Fund is intended to provide the financing for inputs to the private sector firms to undertake the necessary steps leading to energy savings.

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The first step for a successful private sector energy program is a broad-scale business and government commitment to energy conservation and to the systematic methods by which it can be realized. The business community's commitment was determined by First Washington Associates while the Government's commitment can be seen in the letters from Hon. Mr. Edward Seaga, Prime Minister, Minister of Finance and Minister of Mining and Energy (Annex G).

Initially, energy audits must be performed by technicians to collect data on plant energy consumption and costs. The audit data, together with detailed in-plant measurements, can then be used by engineers experienced in energy conservation to identify and evaluate potential energy conservation opportunities (ECO's). These ECOs include alternative energy projects, such as solar water heating, if appropriate and economically feasible. Based on a review of these candidate ECOs, a portfolio of the most economically attractive projects can be selected. The translation of ECOs into energy savings and dollar savings components is the step by which industry commitment to undertaking the measures is achieved. It puts it into the language of the business - pay back, return on investments, etc. The projects are then carried out in the retrofitting phase, with equipment being purchased and installed.

In addition to equipment changes and improvements, another area of investigation for ECO's is operations and maintenance (O&M) procedures. Often these are simple measures that can be performed with little or no cost to improve energy efficiency. A number of these O&M, ECO's can result in overall plant savings of 5 percent or more, and they have a very short payback period, often of only a few months or even weeks. As a follow-up to capital ECO retrofits, operations and maintenance practices are extremely important in order to ensure that existing equipment continues to save energy over its useful life.

The next logical step in the procedure that spans the identification of candidate ECO's through audits, and implementation of conservation retrofits and O&M improvements is the establishment of a domestic industry providing locally made energy conservation and alternative energy products. The successful conclusion of such efforts can be expected to have the greatest and most widely felt effects on both the economy and the energy situation. Whereas loans to finance capital equipment for individual retrofitting projects have a fixed-value energy savings and reduce foreign exchange costs by a finite amount over a given period, a similar size loan used to

finance the development of a new industry will have a continuing and compounding effect in energy savings as long as the firm remains a productive unit. In addition, the availability of locally made products translates to a lower demand for imports requiring foreign exchange with each purchase of the local product.

Some of the inputs to the Program require financing in foreign exchange, while certain others can be financed locally. The large demand for both sources of financing offers justification for establishment of the ECF, and the overall extreme scarcity of foreign exchange makes the existence of an ECF vital if energy conservation measures are to be instituted and new industries developed. Currently, the major share of equipment needs are available only from foreign sources.

D. PROJECT ANALYSIS

First Washington Associates prepared the demand analysis for energy conservation alternative energy equipment and services in Jamaica. The data for the analysis came largely from personal interviews conducted with forty-nine business firms. The firms were selected from a list of the 100 heaviest users of electric power obtained from the billing records of the Jamaica Public Service Co. (JPS). Each of the firms filled out a detailed questionnaire a copy of which is included as Annex I.

Other sources of information included FWA's prior "Analysis of a Preliminary Census of Manufacturing Industry in Jamaica - 1981" which covered 211 Jamaican firms and various studies conducted by the World Bank and the InterAmerican Development Bank.

(i) Demand Analysis (Summary)

The forty-nine firms chosen for the study accounted for a fair portion of the Jamaican economic activity. In 1981, it was estimated that the respondents accounted for about 20% of JPS electric energy consumption, over 10% of the Gross Domestic Product and more than 33% of the manufactured goods exported.

Of the companies interviewed, 65% were interested in having a professional energy audit done to establish ways to conserve electricity and were willing to pay their own money for such an audit. Forty-nine percent (49%) had already taken concrete steps to conserve electric energy and 51% indicated plans to do so in the next two years.

The forty-nine firms interviewed indicated that plans were afoot to make energy conservation investments of almost J\$6,000,000 over the next two years provided financing is available. Extrapolated to the economy as a whole, this implies a potential for maximum investment demand of private business sector of J\$17,800,000 in 1982-84 for energy saving conservation equipment and services.

Financing, however, will be a crucial element as to whether or not the private sector undertakes this investment. Three quarters of the respondents indicated that they would need, or want to use, medium term (over one-year repayment) financing to cover their energy saving investments.

Eightyone percent of the respondents indicated that energy saving investments would have to pay for themselves within five years and it may be assumed that this would be the maximum repayment term on associated financing.

(ii) Demand Analysis (Detailed)

The forty-nine survey respondents represented the manufacturing, commerce, tourism and public service sectors. A list of the firms is given below:

OBS	Name	Line
1	Antilles Chemical Co. Ltd.	manuf
2	Appliance Traders	manuf
3	Ariguanabo Textile	manuf
4	Berec Caribbean Ltd.	manuf
5	Black Block Factory	manuf
6	British American Insurance Co.	comm
7	British American Life Ins. Co.	comm
8	Broadway Group of Companies	comm
9	Butterkist Ltd	manuf
10	Caribbean Broilers (Ja.) Ltd.	manuf
11	Caribbean Casting & Engin.	manuf
12	Caribbean Products	manuf
13	Cigarette Co. of Ja. Ltd.	manuf
14	CMP Metal Products Ltd.	manuf
15	Colgate Palmolive	manuf
16	Cremo Ltd.	manuf
17	Desnoes & Geddes Ltd.	manuf
18	Durable Products Co.	manuf
19	Federated Pharmaceutical Co.	manuf
20	Gleaner Company	manuf
21	Guinness Ltd.	manuf
22	Industrial Chemical Co.	manuf
23	Industrial Commercial Develop	comm
24	Industrial Gases Co. Ltd.	manuf
25	J. Wray & Nephew Co. Ltd.	manuf
26	J. L. A. Hatchery Ltd.	manuf
27	Jamaica Biscuit Co.	manuf
28	Jamaica Frozen Food Ltd.	manuf
29	Jamaica Oxygen and Atyl Ltd.	manuf
30	Jamaica Package Indu. Ltd.	manuf
31	Jamintel	other
32	Johnson and Johnson Co.	manuf
33	Kiskimo Ltd.	manuf
34	Metal Box Jamaica Ltd.	manuf
35	National Continental Corp	comm

OBS	Name	Line
36	New Yarmouth Ltd.	manuf
37	Servwell Stove Ja. Ltd.	manuf
38	Shaw Park Beach Hotel	hotel
39	The Alkali Group of Companies	manuf
40	Thermo Plastic Co. Ltd.	manuf
41	Tropical Battery Co. Ltd.	manuf
42	United Dairy Farmers	manuf
43	Universal Stores Ltd.	comm
44	Urban Development Corp Ltd.	other
45	Van Leer Jamaica Ltd.	manuf
46	West Indies Glass Co. Ltd.	manuf
47	West Indies Home Contractors	manuf
48	West Indies Pulp, Paper Group	manuf
49	Zero Processing & Storage Ltd.	manuf

The firms can be further disaggregated into different categories. A further breakdown of the forty-nine respondents is as follows:

	<u>Number</u>	<u>Percent</u>
Construction & Building Products	2	4.1
Chemicals	5	10.2
Electrical apparatus & appliances	4	8.2
Food processing	8	16.4
Garments	1	2.0
Paper products & packaging	5	10.2
Pharmaceuticals & cosmetics	3	6.1
Plastic products	1	2.0
Rum & liquer	3	6.1
Tobacco, cigarettes & cigars	1	2.0
Wholesale & retail sales	4	8.2
Insurance	2	4.1
Public Service	2	4.1
Hotel	1	2.0
Miscellaneous Manufacturing	<u>7</u>	<u>14.3</u>
Total	<u>49</u>	<u>100.0</u>

Twentytwo firms were completely owned by Jamaicans, seven were foreign owned and fifteen were of mixed ownership.

The typical firm in FWA's energy survey runs an average of two shifts/day and employs under 300 people. The average monthly electric bill is J\$85,000 and its average monthly fuel bill is J\$27,000. The typical firm has competent management and an attitude that if an investment will pay for itself in a reasonable period of time, it should be undertaken.

Twentyfour out of the forty-nine firms surveyed had taken steps to reduce their energy consumption provided financing was available. If the planned energy investments of almost J\$6,000,000 is extrapolated to the economy as a whole, it conservatively implies a potential maximum investment demand by the private business sector of J\$17,800,000 in energy saving equipment and services. These steps include upgrading productive machinery, installing window films, timers, fluorescent lighting, new insulation for refrigeration equipment, cleaning burners, purchasing heat recovery systems, modifying a boiler, refurbishing a furnace, etc. In some cases, the payback period was twelve months and normal payback was four years or less.

Half of the respondents indicated existing plans included capital investments to reduce energy consumption over the next two years. These investments are summarized below:

Planned Energy Investments

	<u>Total</u>	<u>Commer</u>	<u>Hotel</u>	<u>Manuf.</u>	<u>Other</u>
No. of Companies	49	6	1	40	2
Total Investment(J\$)	5,919,000	50,000	200,000	5,669,000	0
<u>Of which:</u>					
Energy generating equipment (J\$)	875,000	0	0	875,000	0
Equipment to increase output with present electricity use	4,050,000	0	0	4,050,000	0
Equipment to maintain existing output with less energy use	994,000	50,000	200,000	744,000	0

Eleven out of the forty-nine survey respondents indicated that they postponed energy investments because the interest cost associated with financing was too high (18% or more). Ten firms indicated that the repayment terms available from the banks did not exceed twelve months which they considered was too short thus inhibiting them from making the energy investments.

The type of energy investments which the firms postponed is shown in the table below:

POSTPONED ENERGY INVESTMENTS

	<u>Total</u>	<u>Commer.</u>	<u>Hotel</u>	<u>Manuf.</u>	<u>Other</u>
Number of investments in equipment to generate electrical energy	4	1	0	2	1
Number of investments in equipment to maintain existing level of output with less energy consumption	3	0	0	3	0
Number of investments in equipment to increase output with same energy consumption	6	2	0	4	0

Based on interviews conducted with about a dozen actual and prospective energy industry investors in Jamaica, it is clear that there is indeed a demand for credit for investments in the energy conservation and solar equipment industries. In fact, Jamaican National Investment Promotion (JNIP), already has two proposals for projects in these areas which total over \$2 million (U.S.) in requested loans. These projects are for the manufacture and installation of solar crop dryers and computerized energy management systems.

The industry leader in Jamaica is Appliance Traders Ltd., which assembles and markets solar water heating panels and systems. They have been in this market for over four years, and presently install about 100 residential hot water systems annually. They have also installed systems for hotels, hospitals, and institutional kitchens. As the primary industry in Jamaica already established, Appliance Traders seems hesitant to state that a loan fund for industrial development (which could go to their competitors) is needed. Instead, Appliance Traders would prefer that low-interest loans be available to permit the masses to afford solar water heating.

The other companies interviewed were much more positive in their belief that the fund could benefit them. These companies were established much more recently and see the loan funds as a badly needed source of foreign exchange for raw materials and parts. Certain of these companies are operating as distri-

butors of U.S.-made products in addition to their own lines, and the availability of foreign exchange would enhance these arrangements.

Tropical Energy (est. 1981) - manufactures solar collectors, heat exchangers for air conditioners, and fluorescent light fixtures. Distributors for solar control window film, photovoltaic (solar cell) panels, and control systems.

KIW Hardware (est. 1907, in solar for three years) - has installed about 100 residential solar hot water systems over last three years, 10 have been in other Caribbean countries. They have established joint ventures with Sun Ray of Ontario, Canada to distribute solar collectors and with E-Systems of Texas U.S. to manufacture their collectors in Jamaica.

MAC SIM Ltd. (est. 1970) - has manufactured solar collectors since 1981, and installed five solar hot water systems in 1981.

Econergy Engineering Services (est. 1980) - provides energy conservation consulting services and manufacture solar hot water heating panels and air-conditioning heat exchangers to produce hot water.

Dunn's Equipment Engineering (est. 1975) - provides energy conservation consulting services, equipment maintenance, mechanical equipment design and manufacturing, piping, and insulation.

In addition to these companies already in the marketplace, the following potential projects have been identified by JNIP or from interviews with their proponents:

1. Manufacture of solar crop dryers - Energy Management, Ltd. of Clark and Clark Ltd., in a joint venture with International Solar Technologies, Inc., Plainfield, Indiana.
2. Installation and maintenance services for computerized energy management systems, with eventual manufacturing of sub-assemblies - Southern Energy Management, Inc., Pompano Beach, Florida.
3. Establishment of maintenance service to vacuum and steam clean air conditioner registers, ducts, air handling fans, and coils - Texas Industrial Vacuum Services, Houston, Texas (Mr. Larry Foster).
4. Manufacture of gaskets to repair steam leaks, water leaks, inefficient engines and filters to prevent maintenance problems and inefficiencies in engines, air conditioners and industrial systems - Teape-Johnson, Ltd. (Dr. Franklin Johnston).

5. Distribute U.S.-made industrial insulation and manufacture calcium silicate pipe insulation using locally available raw materials (gypsum) - El-Mech Engineers, Ltd. (Mr. Trevor Bernard).
6. Manufacture, or assemble from kits, switches and timers to reduce electrical energy consumption in air-conditioning and lighting systems - Wonards Radio Engineering Ltd. (Mr. Edward C. Wong).
7. Manufacture efficient wood stoves for cooking to replace use of gas and electric and to extend wood supplies of the poor - Dunn's Equipment Engineering (Mr. Trevor Dunn).
8. Manufacture industrial heat exchangers for waste heat recovery from boilers and other heat sources - Controls Engineering and Chemicals Ltd. (Mr. Trevor Sutherland).
9. Establishment of systematic boiler tune-up service using digital oxygen and combustibles stack gas analyzers to improve boiler efficiency-(El-Mech (Mr. Bernard) and Dunn's Equipment (Mr. Dunn).

Interviews showed that these prospective business venturers were unanimous in their view that the loan funds were needed in order that they be able to acquire the necessary raw materials, parts, initial inventory, or specialized test equipment necessary to set up operations. There was concern expressed that the funds might go only to established companies and that their lack of a long track record in the field might preclude them from receiving loans.

The availability, terms and conditions of financing play a critical role in whether or not the firms surveyed will proceed with their energy investment plans. The financing must provide both foreign exchange and local currency at an acceptable interest rate and a reasonable repayment period. About 97% of the forty-nine firms indicated a desire for financing energy investments. Forty-three percent (43%) of the firms expected their investments to pay for themselves in a maximum of five years, 14% in four years, 16% in three years and 8% in two years or less. These facts are shown in the table on page 22.

With regard to interest rates, most firms indicated that the maximum rate they were financially able to pay was 15 percent per annum. However, 59% indicated that they might pay a higher rate if really necessary with the overwhelming majority indicating that the absolute limit would be in the range of 17 percent per annum.

proposed financing of energy saving equipment

	<u>total</u>	<u>commercial</u>	<u>hotel</u>	<u>manufacturing</u>	<u>other</u>
number of companies	49	6	1	40	2
companies planning equipment purchases ---					
energy generating equipment	11	2	0	9	0
maintain existing level	13	1	1	11	0
increase output	12	1	0	11	0
expected payback period for capital investments ---					
1-5 years	21	0	1	20	0
percent of total	43	0	100	50	0
6-10 years	7	2	0	5	0
percent of total	14	33	0	13	0
11-15 years	8	2	0	6	0
percent of total	16	33	0	15	0
16-20 years	3	0	0	3	0
percent of total	6	0	0	7	0
21 years or less	1	0	0	1	0
percent of total	2	0	0	2	0
source of funds for proposed purchases ---					
from firms earnings	10	2	0	7	1
percent of total	20	33	0	17	50
short term bank loan	11	1	0	10	0
percent of total	22	17	0	25	0
medium term bank loan	12	1	1	9	1
percent of total	24	17	100	22	50
long term bank loan	10	1	0	9	0
percent of total	20	17	0	22	0
other	15	2	1	11	1
percent of total	31	33	100	27	50

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E. Economic and Financial Analysis

Introduction

Jamaica's severe foreign exchange shortage is the single most important deterrent to economic recovery. The country's near total dependence on imported petroleum, along with one of the developing world's highest per-capita energy consumption rates, is a major contributor to the foreign exchange crisis. In Jamaican fiscal year 1983/84, it is anticipated that over one-half of foreign exchange earnings from merchandise exports will be required to pay for petroleum imports. The energy sector, therefore, is a natural place to seek economizing measures to free foreign exchange for imports of other productive inputs that are crucial to the economic recovery level.

Experience in the United States and elsewhere suggests that plant and equipment put in place in the era of cheap oil can often be subjected to relatively modest modifications that yield substantial savings in energy consumption. Experimental studies conducted in Jamaica by Georgia Tech undertook to determine whether such energy conservation opportunities appeared to exist. Ten experiments were conducted in Jamaican firms in which preliminary examinations indicated a strong likelihood that significant energy economies could be gained. USAID/Jamaica's energy officer, Dr. Franklin Ahimaz, has reviewed the technical aspects of the experiments and finds them professionally sound.

The financial and economic implications of these case studies are highly impressive. Using a discount rate of 12 per cent to reduce the projected savings to present value, only one of the ten failed to appear unequivocally viable in economic terms. Moreover, the assumptions on which the analyses were conducted were so conservative that the one case of negative net present value could be considered viable as well. The internal rate of return for that case was 8.73 percent. However, it was assumed that there would be no inflation over the life of the project. Consequently, the 12 percent discount rate used represents a 12 percent real rate of interest. If expectations generally were for no inflation, it is unlikely that the appropriate rate for discounting private investment projects would be as high as 12 percent.

Pro-forma analyses of the five cases estimated to involve the most modest savings are presented in Annex I. Aside from the case of the 8.73 percent IRR referred to above, each of these cases has an internal rate of return of 15 percent or more. The five most promising cases included three with internal rates of return of more than 50 percent, of which two were over 75 percent.

In general, the results were quite robust. Experimentation with varying rates of price inflation (with increased inflation generally increasing savings), discount rates, exchange rates, and discount rates, failed to undermine the qualitative conclusion that the cases examined gave strong support to the proposition that significant energy conservation opportunities are available in Jamaican industry.

It was not the purpose of these case studies to provide statistical evidence from which inferences could be drawn about a benefit-cost ratio for the project as a whole. Rather, the purpose was to test more vigorously the intuition that a program of formal energy audits might turn up results that would be sufficiently attractive to induce private, profit-seeking entrepreneurs to undertake energy conserving investments. The results reinforce that intuition.

Summary of Case Studies

The current energy consumption of the plants audited is about 6 million kilowatt-hrs (KWH) of electricity and 175,500 MMBTU of fuel. Among the plants audited was a sugar factory which has waste material available for use as a fuel and generates all of its electricity needs, using bagasse, diesel oil and bunker "C" as fuel. For all plants except the sugar factory, total electricity consumption is 6 million KWH of electricity and 41,000 MMBTU of fuel during 1981. Given the ECOs identified, it was estimated that as a result of implementing corrective measures, savings to the extent of 2 million KWH/yr. of electricity and 9,400 MMBTU of fuel could be achieved. Electricity savings ranged from 14% from commercial buildings, to 65% for the chemical plant. In the case of the commercial buildings, previously identified ECOs had been taken advantage of and in the case of the chemical plant the level of savings is due to an opportunity for generating electricity on site utilizing waste heat from an exothermic chemical reaction.

Fuel savings ranged from 3% for a food manufacturing plant to 49% for a hotel.

For the plants audited, the annual energy costs totalled in excess of J\$3.6 million and excluding the sugar factory amounted to approximately J\$2.0 million. The total annual energy cost savings for ECOs are estimated at over J\$1.10 million. The 28 of 33 ECOs (excluding sugar) considered to be worth undertaking have projected annual savings totalling nearly J\$560,000 per year. Foreign exchange cost-savings total over US\$500,000 for all plants and over US\$200,000 if the sugar ECOs are excluded. Cost estimates for carrying out the 33 ECOs are approximately US\$1.57 million of which US\$0.97 million represents foreign exchange costs.

Operation and maintenance ECOs totalling 7 were found in the five plants. The cost for effecting these ECOs is J\$51,200 of which only US\$15,630 represent foreign exchange costs. The estimated savings are J\$68,800 in energy costs to the plants and US\$28,500 in imported petroleum costs.

In order to look at the financial viability of the ECOs and to show that there is at least a justification for the establishment of a credit fund to enable the private sector to finance investment in retrofitting, the ECOs identified in the private sector will be selectively analysed. For each industry, an analysis of two energy conservation opportunities will be carried out as far as possible giving as wide a coverage to each type of ECO identified by the survey.

Hotel Sector

ECO (Airconditioning, Heat Recovery & Hot Water Production)

The problem to be addressed in this case is the replacement of the chiller system for air conditioning serving the east end of a new wing of a tourist hotel. Hot water supplied to the rooms is provided by an oil-fired boiler and shower-head nozzles deliver too high a flow rate of hot water.

The recommendation is to replace the chiller system with a new unit incorporating modulating controls and heat recovery to heat domestic hot water using heat rejected in the refrigerant de-super heater and condenser sections. Flow restricting bathroom shower-heads are also to be installed.

The estimated cost for design, acquisition and installation of the recommended change is US\$41,096 (J\$73,150), including duty. The foreign exchange component of the cost of the recommended change is US\$25,850 (J\$46,013) and duty on the imported equipment is US\$4,634.80 (J\$8,250.00).

As a result of the implementation of this ECO, it is estimated that savings in electricity will be US\$8,034 (J\$14,300) and LP gas US\$4,721 (J\$8,404) and savings in maintenance cost of US\$124/year. The cost of conducting the energy audit is not included in this feasibility analysis due to its nature of a sunk cost which has no bearing on the feasibility of implementing the ECO.

Chemical Manufacturing Plant

The ECO chosen was a motor replacement ECO.

ECO (Electric Motors)

The existing conditions which presents an ECO involves the use of standard industrial motors which are rewound locally when they fail. The recommendation is to replace the existing motors with energy efficient motors instead of rewinding.

The estimated cost for the design, acquisition and installation of the recommended change is US\$24,941.

ECO (Heat Recovery & Production of Hot Water)

The use of an oil fired steam boiler to provide hot water for milk and ice cream pasteurization process and also for plant clean-up presents an opportunity for energy conservation. It is observed that an integrated system of waste heat recovery installed on an already proposed 130 ton ammonia refrigeration system could significantly reduce the amount of oil presently used in the plant.

The initial cost of the waste heat recovery system is estimated at US\$36,000 (foreign exchange component US\$24,000), including pumps, heat exchangers and hot water storage tanks.

Food Sector

ECO (Electric Motors)

The food products manufacturing plant has installed standard efficiency motors which are rewound when they fail. The high cost of electricity in Jamaica makes it a potentially attractive prospect to replace such motors with "high efficiency" motors; although it is not financially feasible to directly replace serviceable motors unless the plant operates 24 hours per day.

The capital cost for implementing this ECO is US\$6,864.00 and maintenance costs will not be affected by the change.

The replacement of the motors instead of rewinding them when they fail with "high efficiency" motors is expected to result in annual savings of electricity of 19284 KWH and the electricity cost savings amount to US\$2,502.

The new motors have an estimated useful life of 5 years.

ECO Sugar Factory (Process Heating)

Installation of Bagasse Dryer

Bagasse, which is the cellulose by-product of sugar extraction from cane is currently used as fuel in boilers number 1 through 5. During the sugar crop (about 6 months of each year), this bagasse supplies nearly all of the energy requirement, for steam and electricity, of the sugar and rum factories.

During the off season, there is no bagasse available and a 6th boiler is operated to supply steam for power generation and for the rum factory which operates all year round. The opportunity exists for providing some steam from bagasse during the out-of-crop season to reduce the use of Bunker C oil.

The recommendation is to install a rotary dryer, using bagasse boiler exhaust gases as a source of heat to dry the bagasse eliminating the need for additional energy for drying the bagasse.

The capital cost of this recommendation has been estimated at US\$932,584, including duty and installation. The estimated savings are US\$247,191 per year.

Prepared by: [illegible]
Date: [illegible]

F. INSTITUTIONAL ANALYSIS

(i) The National Development Bank

The following information on the National Development Bank of Jamaica Ltd. is provided in accordance with the USAID Handbook of Instructions (Appendix 4A - Intermediate Credit Institutions):

Official Name of Institution and Address:

National Development Bank of Jamaica Limited (NDB)
11a - 15 Oxford Road, P. O. Box 8309
Kingston 5, Jamaica W.I.

Telephone - (809) 92-94000
Cable/Telex - NDBJAM KINGSTON

Nature of Present Financial Operations

NDB is a secondary development banking institution for Jamaica, which will provide medium and long-term fixed interest rate funding assistance to local commercial lending institutions for on-lending to eligible projects that meet developmental objectives of Jamaica. The attached statements on Policies and Strategy, and Operating Criteria (Annex J) further elaborate on NDB's mode of operation. NDB's program is designed to ensure availability of term financing for industry which has been lacking in recent years.

Legal Status of NDB

The NDB was formed as a limited liability company in 1981, and is wholly owned by the Government of Jamaica. Registered Articles of Association are available in Annex J.

NDB Policy Statements and Operations Rationale

As noted earlier, NDB will not normally lend directly to projects. Instead, NDB will lend to Approved Financial Institutions for onlending to project sponsors. The basic policies of NDB are summarized in the following attachments available in Annex J: Policies and Strategy; Operating Criteria; and Operating Procedures. The rationale for operating as a secondary financial institution is to encourage private sector innovation and risk-taking and simultaneously minimize NDB portfolio risk. NDB will be insulated from the commercial project credit risk borne by the Affiliated Financial Institutions.

Initial lending operations of NDB will be carried out through intermediary financial institutions (AFIs) approved by NDB for participation in the program. To meet NDB criteria each institution has to be properly registered, and designate at least one senior executive with an appropriate background to be responsible for project evaluation and coordination with NDB. At present there are 9 commercial and 6 merchant banks that could participate in the proposed project. Three merchant banks are associated with commercial banks and three are independent. As a safety precaution NDB has an exposure limit not to exceed two times the net worth of each AFI except when an AFI presents a separate guarantee satisfactory to NDB. This limit may be changed as more experience is gained, particularly with merchant banks. The Jamaica Co-operative Credit Union League is also a participant in the NDB program and acts as an AFI for the small business sector.

Participating AFIs will assume the entire commercial risk for their subloans and will be expected to participate in subproject financing, providing at least the necessary short-term working capital. They will be primarily responsible for appraisal and supervision of subprojects they finance. Each AFI will be obliged to repay NDB according to an agreed schedule irrespective of whether the sub-borrower meets his repayment obligations. Rescheduling of subloans would be subject to NDB prior concurrence.

For their services and risk-taking AFIs will receive an interest spread of 3% p.a. This spread has been found acceptable by potential AFIs (see Annex K) but may be revised as experience is gained regarding the performance of individual AFIs. As an inducement to term lending by commercial banks, their loan portfolios financed by NDB will be exempted from reserve requirements.

Each AFI will be required to send to NDB semi-annually their financial statements, annual estimates of their lending activities, and copies of subproject supervision reports. NDB will review annually the performance of each AFI, make appropriate recommendations and, as needed, provide appropriate staff training facilities.

A current status report on AFIs (Memo dated May 16, 1983 from H. Abrikian, Treasurer of NDB) is included in Annex J.

There will be a limit on the size of a sub-loan, but sub-loan Borrowers will have to comply with a maximum debt to equity ratio of 4:1 in the case of sub-loan projects having net fixed assets below J\$300,000.

Projects are expected to have a minimum Debt Service Coverage Ratio of 1:5 and a minimum Internal Rate of Return of 12%.

All subprojects will be appraised and approved by AFIs. AFIs will have responsibility for supervision of their subprojects. NDB will ensure through staff visits and other means that proper supervision is being carried out.

Commercial banks, who dominate the Jamaican financial markets, are mainly locally owned, but still retain strong ties with their present or past parent institutions in Canada, England and USA. They generally follow the traditional banking principles of safety and liquidity, making mostly well secured short-term loans which can be rolled over subject to yearly reviews. About 10 percent of their portfolios is in mortgage loans to selected clients secured either by residential properties valued at least 25 percent above the loan amount, or by tangible business assets valued 50 percent or more over the loan. In addition, commercial banks usually establish a "ceiling" for each borrower above which they will not lend irrespective of additional collateral or activity to be financed. In 1982, the commercial banks' outstanding loans for manufacturing activities amounted to over J\$320 million, representing over 20 percent of their overall loan portfolios.

NDB's exposure limit to AFIs of 2 times an AFI's net worth, bank lending practices, plus NDB review of projects submitted for funding will all help to ensure that proper program risk management exists.

Description of Capitalization

The share capital of NDB is J\$20 million of which J\$10,051,569 is presently subscribed and paid in by the Government of Jamaica. Attachments in Annex J describe the equity and debt capitalization sources to date for the NDB.

Financial Statements

The audited financial statements for the year ending September 30, 1982 along with interim financial statements as of March 31, 1983 are available in Annex J.

Organization Structure

The organization structure of NDB is detailed below.

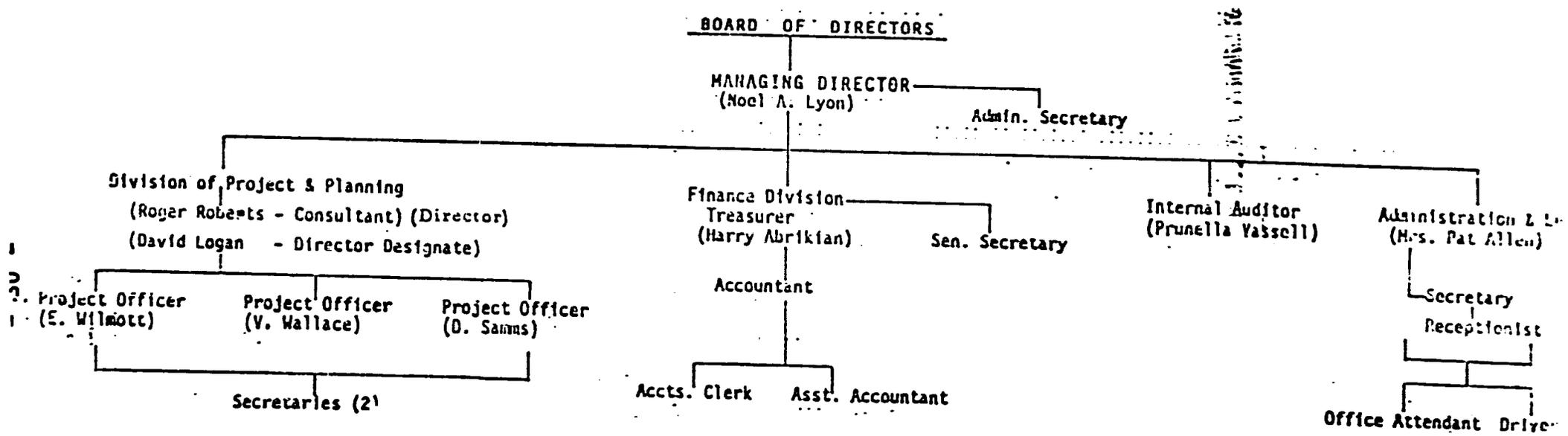
Background Data on Directors and Management

A Directors' List and the Curriculum Vitae of NDB's management is included as a part of Annex J.

NATIONAL DEVELOPMENT BANK OF JAMAICA LIMITED

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ORGANISATION CHART



Loan Application Procedures

It is anticipated that the Energy Credit Fund program will operate basically in the same way as the existing NDB loan assistance program. A project promoter will apply directly to an AFI who will be responsible for evaluating the application from a financial and credit point of view and making a decision whether or not to finance the project. The AFI in turn, will apply to NDB for funding the loan.

The loans will be disbursed in accordance with an agreed project disbursement schedule with overseas suppliers paid by means of a letter of credit. The letter of credit will serve to collect the necessary documents to permit A.I.D. reimbursement and NDB drawdown under the Energy Credit Fund facility. The AFI will have a continuing responsibility to monitor project and collect loan payments. The AFI repayment responsibility to NDB is independent of the repayment of the sub-loan project borrower. That is to say the AFI will repay its loan to NDB regardless of its loan experience with the project borrower. It is not expected, therefore, that NDB will be involved in the loan collection process with sub-loan project borrowers.

The AFIs will make their best efforts possible to reduce the collateral requirements and eligibility criteria for small and medium size borrowers.

Details of NDB's existing operating and loan processing procedures are contained in the Operating Procedures in Annex J.

Training Program at NDB

Under a separate contract, NDB is being provided the services of a U.S. consultant to provide on-the-job training for NDB staff and institution building at NDB.

(ii) The Energy Division, Ministry of Mining and Energy

To implement Phase I of the Energy Sector Assistance Project, the Energy Division has been building institutional capability for the past two years in the areas of Energy Conservation and Alternative Energy. The Public Education Program of the Energy Division has been particularly aggressive in trying to educate and raise the awareness level of Jamaica's citizenry towards the need for and benefits from energy conservation and alternative energy opportunities.

Hence, the institutional needs to implement Phase II, as far as the Energy Division-MME is concerned, are already in place. The areas for which the Phase II project will look to the Energy Division for inputs are the (a) identification of a Project Officer for Phase II, (b) promotion of the Phase II project by the Public Education Unit so that it is widely advertised and the private sector is knowledgeable about the loan opportunities under the project (c) documentation of energy saving data for use as

verifiable indicators for project evaluation and (d) guidelines for undertaking audits (formats, calculations) payback and return on investment ranges and types of projects attractive for funding. In addition, a listing of certified auditors and technical specialists for referral through the financial intermediaries to the ultimate users.

G. ADMINISTRATIVE ANALYSIS

(i) Resources - The Energy Credit Fund (ECF)

The initial funding of the ECF will consist of a loan from USAID in the amount of US\$1,600,000 and a loan from the GOJ in local currency equivalent (at the official exchange rate) of US\$400,000. These resources may be augmented by new lines of credit or allocations of other NDB resources as may be determined by NDB Board of Directors. The recommended breakdown of resources by subfund activity is indicated in the section on Cost Estimate and Financial Plan.

The commercial banks will be authorized to approve loan applications for each applicant of up to a maximum of US\$200,000. For loans exceeding US\$200,000 and up to a limit of US\$500,000, USAID/Jamaica's prior approval will be required; the sub-loan ceiling of \$200,000 will be waived only on an exceptional basis.

(ii) Eligibility Criteria

ECF credit will be granted to private sector enterprises in the commercial, distributive, manufacturing, industrial, tourism and service sectors of the Jamaican economy. The ECF is intended to support projects which, in addition to being technically, economically, and financially sound, will:

- reduce the consumption of energy per unit of output, thus lowering the amount of imported petroleum and by-products;
- substitute renewable energy sources for non-renewable ones, similarly lowering the amount of imported petroleum and by-products;
- support the development of domestic industries to provide alternative energy and energy conservation equipment and services, both for local consumption and export; and
- identify specific energy conservation opportunities to interested firms in the private sector, which may be implemented without need for substantial capital expenditures.

The Project does not preclude energy companies interested in purchasing conservation equipment under the ECF and leasing the equipment to potential users in the public or private sector.

The resources of the ECF may not be used to finance:

- refunding of debts to third parties, partners, or owners of the enterprise benefited by the credit;
 - leasing or purchase of lands or of commercial buildings;
 - used machinery and equipment;
 - payment of dividends or recovery of invested capital;
 - purchase of shares, bonds or other securities;
 - payment of salaries and other administrative expenses.
 - industries which are not economically viable in the absence of tariff protection.
- (iii) Approval of Subloans

A uniform application form should be used by all subloan applicants, which will be submitted to the financial intermediary. Approval of the loan by the commercial banks should be based on a thorough financial analysis and a technical evaluation of the proposal. It should also constitute a determination that the project meets ECF program objectives and criteria, that the project is technically, economically and financially sound and that there exists reasonable assurance of repayment.

(iv) Eligible Applicants

Applicants eligible for ECF consideration may be new or established business firms. Ownership may be Jamaican, mixed or foreign provided the company is established in Jamaica. The form of business may be a corporation, partnership or proprietorship.

(v) Loan Application Process

The MME working closely with NDB will provide the commercial banks with (a) a list of qualified energy auditors in Jamaica and (b) a list of energy conservation opportunities that have attractive payback periods, marked savings in energy consumption and are supportive of the National Energy Plan. This list will be updated as national priorities for conservation and alternative energy projects change. NDB should provide the commercial banks with criteria for evaluating the technical, economic and financial soundness of the projects which will be used to select viable projects.

A borrower, considered a potential client by the commercial bank, will be encouraged to utilize the services of anyone on the list of energy auditors to conduct an energy audit. While evaluating a borrower as a potential client, the commercial banks will make best efforts possible to reduce the collateral requirements for small and medium-sized firms.

The commercial banks will furnish 90 percent of the energy audit costs in J\$ from the ECF and the client will be required to furnish the balance or J\$250 whichever is lower. If the energy audit develops into an energy conservation or alternative energy project, the 90 percent contribution by the commercial banks from ECF will be rolled over into the total loan package for the project. In cases where the energy audit does not result in a project, the funds advanced for the audit will be charged to NDB.

Copies of all energy audits, funded by the commercial banks, whether the audit developed into a loan or not, will be sent NDB.

The loan application for projects funded by ECF will require the borrower to record monthly energy consumption data for one year after installation of the energy conservation devices or retrofits. The data should be furnished to MME on a monthly basis for one year.

The borrower also agrees to maintain the operation and maintenance schedules for the newly installed retrofits.

(vi) Responsibilities for Approved Loans

Once the loan is approved, the financial intermediary will be responsible for:

- bearing the risk of nonpayment under the subloan;
- monitoring subloans in accordance with the terms and conditions of the subloan;
- notifying the NDB of any serious problems and taking any other steps necessary to assure proper administration of the subloan; and
- submitting such documentation and reports and verification, inspection, and subloan status to the NDB and MME as may be required.

(vii) Interest Rates

The interest rate for the loan will be guided by the prevailing market rate. Various fees and charges will be paid out of the interest rate, as follows:

- 1 percent to cover the exchange risk assumed by the Government of Jamaica;
- 2 percent to be paid to NDB to cover administrative fees;

- 3 percent to be paid to the financial intermediaries for services and repayment risk (for analysis refer Annex K);
- the balance to be used to meet the debt service requirements of USAID and to augment the ECF resources.

There will be a preliminary review of the project six months after disbursement of the first loan from ECF or the depletion of the first tranche to the ECF whichever occurs sooner. The evaluation team will assess:

- the impact of the excise tax, customs duty and consumption tax as incentives/disincentives on the utilization of the ECF resources;
- the rate of depletion of the US\$ component of the ECF;
- the reasons why energy audits conducted under the Project did not evolve into loan projects: Did the commercial banks seek high levels of collateral that deterred small and medium sized firms from utilizing the funds?
- the rate of interest charged;
- the level of energy savings that can be anticipated from the conservation or alternative energy projects approved by the commercial banks;
- the procedure for the expeditious execution of all the necessary authorization and clearances for the importation of equipment and materials by sub-borrowers; and
- the procedure for the review and approval of loans by the commercial banks.

The evaluation team will identify bottlenecks in the process and recommend approaches to streamlining the process.

The recommendations of the evaluation team would be discussed by USAID and GOJ representatives and a course of action agreed upon for the continued operation of the Project. The second tranche from USAID will be disbursed after agreement on a course of action is reached and the necessary modifications in the implementation of the Project are instituted.

(viii) Disbursements

The ECF will be set up as a revolving fund under which advances will be made from USAID to the NDB. In the case of subloans requiring foreign exchange for imported goods, the NDB will authorize the opening of a letter of credit covering purchases by the ultimate beneficiary. On receipt of adequate documentation as may be required by NDB, (including a declaration that the expenditures were incurred solely for the project financing under the subloan) funds will be released to the financial intermediary for payment through a U.S. commercial bank direct to the overseas supplier. As drawdowns are made, NDB will provide the necessary documentation as required by USAID to verify the disbursement.

Disbursements of the entire amount of the local currency part of the loan will be made by NDB to the financial intermediary as soon as a loan is approved. The financial intermediary must submit to NDB a banker's report of payment and a prescribed request for reimbursement together with such documentation as may be required by USAID and NDB including, but not limited to, cash receipts, receipted invoices, prepaid bills of lading, and/or any other customarily accepted instruments including the declaration that these expenditures were incurred solely for the project financing under the subloan. Disbursement of funds from the financial intermediary will be made directly to the supplier of goods and services on the ultimate beneficiaries behalf.

(ix) Repayment

All subloans are to be denominated and repayable in Jamaican dollars equivalent to the amount of local and foreign currency disbursed. In the case of imports financed under the subloan, disbursements shall be charged against the subloan note at the parallel rate of exchange prevailing on the date of disbursement.

Repayment periods for all subloans will vary with the size of the project, with subloans repayable over a maximum term of five years.

(x) Reflow of Funds

After the initial disbursement of U.S. dollars through the Energy Credit Fund, local currency repayment will be made to the National Development Bank. These funds will be relent over the first five years to finance energy related activity as set forth in the Project Paper Supplement. Should a need for further foreign exchange be evident, the GOJ will make best efforts to make necessary foreign exchange resources available. The use of ECF reflows will be reviewed by GOJ and AID after five years and may, at that time, be folded into NDB's general resources for relending to a variety of activities, including energy, deemed eligible by NDB's operating criteria.

(xi) Role of MME

Since MME is committed to updating the National Energy Plan annually, it is in a unique position to determine the type of energy conservation opportunities that will yield the greatest savings in energy consumption and marked savings in the oil import bill. Further, MME staff members have completed several energy audits and energy retrofits in the public sector. MME has also trained groups of private energy consultants to conduct energy audits. For Phase II, the Project Officer from MME will provide the financial intermediaries with the following:

- A prequalified list of consultants who are capable of conducting reliable energy audits and whose work is acceptable to MME.
- In cooperation with NDB, MME will prepare a list of energy conservation opportunities that have attractive payback periods, marked savings in energy consumption, good internal rate of return and are supportive of the National Energy Plan. This list will be updated as changes in National Energy Plan and Policies are introduced.

The financial intermediaries will provide the Project Officer, MME, with copies of all the energy audits conducted for ECF loan applicants. In the case of ECF funded projects, the borrower will also furnish MME with energy consumption data on a monthly basis for one year. This data gathering will start immediately after the retrofits have been installed.

VIII. Cost Estimate and Financial Plan

The financial plan calls for \$5,900,000 of A.I.D. funds and a GOJ contribution of \$5,600,000, \$600,000 of which may be composed of in kind services. The Energy Credit Fund will be capitalized with \$5,700,000 of A.I.D. funds and \$5,600,000 of GOJ funds, \$8,000,000 of which will be allocated to retrofitting and alternative energy systems, \$2,500,000 to the energy product service industry, and \$800,000 for TA, all as shown in the following table.

COST ESTIMATE AND FINANCIAL PLAN

	AID (US\$000 FX)	GOJ (US\$000 LC)
A. Establishment of Energy Credit Fund**	5,700	5,600
1. Loans to Industrial/Commercial enterprises for energy audits, retrofits and alternative energy systems	4,000	4,000

	AID (US\$000 FX)	GOJ (US\$000 LC)
2. Loans to Energy Development Products and Energy Services Firms	1,500	1,000
(a) Upgrading Alternative Energy Industry	100	400*
(b) Upgrading Energy Conservation Industry	100	200*
B. Evaluations	200	0
Total	5,900	5,600

* GOJ Contribution will consist of in-kind provisions

** Although the funds are divided into various loan activities, the credit fund will actually function and be administered as a single fund. Funds may, with the approval of USAID/J, be moved from one loan activity to another depending on the progress of the various activities.

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ESTIMATED ACCRUED EXPENDITURE SCHEDULE

(000)

YEAR	1		2		3		TOTALS	
	AID (US\$)	GOJ (L/C)	AID	GOJ	AID	GOJ	AID	GOJ
Audit and Retrofitting Subloans	1,000	500	1,600	1,600	1,400	1,900	4,000	4,000
Energy Industry Subloans	100	200	500	400	900	400	1,500	1,000
Technical Assistance	50	150*	100	300*	50	150*	200	600*
Evaluation	100	0	50		50		200	0
Totals	1,250	850	2,250	2,300	2,400	2,450	5,900	5,600

* GOJ contribution will consist of in-kind provisions

IX. IMPLEMENTATION PLAN

<u>MAJOR ACTIONS</u>	<u>ESTIMATED MONTH</u>	<u>RESPONSIBLE ORGANIZATIONS</u>
Project Authorization Amendment approved and funds allotted	0	AID/W
Loan Agreement Amendment and Relendings Agreement signed	1	USAID/J + GOJ
First Implementation Letter issued	1	USAID/J
Conditions precedent to Disbursement met	1	GOJ
GOJ Project Director on Board full time at MME and coordinator at NDB	1	GOJ
Energy Credit Fund established	1	USAID/J + GOJ
First loan for Industrial/Commercial Enterprises Retrofitting	4	GOJ
Preliminary Evaluation	6	GOJ
Technical assistance for the upgrading of Solar Energy Industry	6	GOJ
Industrial/Commercial Solar Water Heating Program	7	GOJ
Technical assistance for upgrading Energy Conservation Service Industry	8	GOJ
First loan to alternative energy project	9	GOJ
First loan to Energy Conservation Service Firm	10	GOJ
Annual Evaluation of Project	12	USAID/J + GOJ
Second Annual Evaluation	24	USAID/J + GOJ
Final Evaluation	36	USAID/J + GOJ

Technical assistance will be engaged under the Host Country Contracts. The GOJ will obtain AID approval before executing the contracts and will be required to follow the procedures outlined in Handbook XI.

All procurement under the project, including procurement financed by the Energy Credit Fund, will be limited in its source and origin to those countries contained in AID Geographic Code 941 and Jamaica.

Before loans are disbursed to the end-borrower from the Energy Credit Fund, documentation will be submitted indicating that all purchases have their source and origin in AID Geographic Code 941 of Jamaica.

X. Monitoring the Project

USAID/Jamaica has the staff and staff time to monitor Phase II of the Energy Sector Assistance Project.

The Science, Technology and Energy Office is located within the Office of Private Enterprise Development. USAID/Washington has recently concluded an agreement with Department of Energy that will permit Dr. F. J. Ahimaz of the Center for International Development, Argonne National Laboratory, Chicago, to man the office of Science, Technology and Energy for a two-year period. In fact, Dr. Ahimaz is already on board on a short-term contract while his papers for PASA are being processed. He is monitoring one project - Phase I of the Energy Sector Assistance Project and hence would be able to monitor Phase II as well.

XI. Evaluation Arrangements

Three annual evaluations and one preliminary evaluation are planned over the three year, three month life of project. The first evaluation will be conducted one year from the start of the project at which time all elements should be underway. Twelve months later the second evaluation will take place and the final evaluation will be conducted several months before the 9/30/86 PACD.

During the preliminary evaluation, loan reports will be analyzed to determine disbursement progress under each loan category. The interest rate level and structure will be reviewed. Progress under the technical assistance contracts will also be studied. If tax incentives are to be created or existing taxes waived, in order to attract more borrowers, this will be recommended during the preliminary evaluation in conjunction with available findings of the TA team financed under the Board of Revenue Assistance Project.

It is anticipated that the three annual evaluations will be conducted without the need for outside consulting services. If, however, it becomes apparent that such services are necessary, funds are available under the evaluation line item for this purpose.

