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The World Bank

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Report No: 20245

IMPLEMENTATION COMPLETION REPORT
(28605; 28695)
ON A GLOBAL ENVIRONMENTAL FACILITY GRANT

IN THE AMOUNT OF SDR 2.8 MILLION

TO THE

GOVERNMENT OF JAMAICA

FOR

A DEMAND-SIDE MANAGEMENT
DEMONSTRATION PROJECT

June 1, 2000

Finance, Private Sector and Infrastructure Department
Country Management Unit 3
Latin America and the Caribbean Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective)

Currency Unit = Jamaica Dollar J\$
J\$1.00 = US\$ 0.02
US\$ 1.00 = J\$41.04 (February 2000)

FISCAL YEAR
April 1 March 31

ABBREVIATIONS AND ACRONYMS

CFL	Compact Fluorescent Lamp
DSM	Demand Side Management
ESMAP	Energy Sector Management Assistance Program
GEF	Global Environmental Fund
GET	Global Environmental Trust
IDB	Inter-American Development Bank
IPP	Independent Power Producer
JPS	Jamaica Public Service Company, Limited
MME	Ministry of Mining and Energy
NGO	Non-Governmental Organization
NRCA	Natural Resource Conservation Authority
PPF	Project Preparation Facility (WorldBank)
PV	Photovoltaic
SWH	Solar Water Heater
TRC	Total Resource Cost

KWh Kilowatt-hour
M.T. Metric ton (1,000 Kilowatt)
MW Megawatt (1,000 Kilowatt)
MWh Megawatt-hour (1,000 Kilowatt-hour)

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CONTENTS

	Page No.
1. Project Data	1
2. Principal Performance Ratings	1
3. Assessment of Development Objective and Design, and of Quality at Entry	2
4. Achievement of Objective and Outputs	3
5. Major Factors Affecting Implementation and Outcome	5
6. Sustainability	6
7. Bank and Borrower Performance	7
8. Lessons Learned	8
9. Partner Comments	9
10. Additional Information	9
Annex 1. Key Performance Indicators/Log Frame Matrix	10
Annex 2. Project Costs and Financing	12
Annex 3. Economic Costs and Benefits	14
Annex 4. Bank Inputs	15
Annex 5. Ratings for Achievement of Objectives/Outputs of Components	17
Annex 6. Ratings of Bank and Borrower Performance	18
Annex 7. List of Supporting Documents	19

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<i>Project ID:</i> P007400	<i>Project Name:</i> DEMAND SIDE MANAGEME
<i>Team Leader:</i> Joerg-Uwe Richter	<i>TL Unit:</i> LCSFE
<i>ICR Type:</i> Core ICR	<i>Report Date:</i> June 1, 2000

1. Project Data

Name: DEMAND SIDE MANAGEME *L/C/TF Number:* 28605; 28695
Country/Department: JAMAICA *Region:* Latin America and Caribbean Region
Sector/subsector: IY - Other Industry

KEY DATES

	<i>Original</i>	<i>Revised/Actual</i>
<i>PCD:</i>	<i>Effective:</i> 08/15/94	
<i>Appraisal:</i> 10/03/93	<i>MTR:</i>	11/06/96
<i>Approval:</i> 06/01/94	<i>Closing:</i> 12/31/98	12/31/99

Borrower/Implementing Agency: GOVERNMENT OF JAMAICA/JPS
Other Partners: IDB; ROCKEFELLER FOUNDATION

STAFF	Current	At Appraisal
<i>Vice President:</i>		
<i>Country Manager:</i>	Orsalia Kalantzopoulos	Yoshiaki Abe
<i>Sector Manager:</i>	Susan Goldmark	Peter Ludwig
<i>Team Leader at ICR:</i>	Joerg-Uwe Richter	Abderrahmane Megateli
<i>ICR Primary Author:</i>	Sunil Mathrani	

2. Principal Performance Ratings

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HL=Highly Likely, L=Likely, UN=Unlikely, HUN=Highly Unlikely, HU=Highly Unsatisfactory, H=High, SU=Substantial, M=Modest, N=Negligible)

Outcome: S
Sustainability: L
Institutional Development Impact: SU
Bank Performance: S
Borrower Performance: S

Quality at Entry: S QAG (if available) ICR
S
Project at Risk at Any Time: No

3. Assessment of Development Objective and Design, and of Quality at Entry

3.1 Original Objective:

According to the June 1994 GET Fund Grant Agreement and the March 1994 GEF Memorandum and Recommendation of the Director, which constitutes the basic appraisal document, the main objectives of the Project were to (i) demonstrate, on a pilot scale, and over a five-year time frame, the potential for electricity savings to reduce fossil fuel requirements for electricity generation, with corresponding reductions in CO₂, NO_x, and SO₂ emissions; and (ii) strengthen the institutional capacity of the electricity sector and other relevant public and non-public agencies to engage in energy efficiency enhancement, implement the savings programs developed through the Project on a larger scale, and develop a framework for broadening the program on a country-wide scale. The broader, long-term objective was to develop the basis for expanding the scope of the program (if successful), on a Jamaica-wide basis and for having electric utilities in other developing countries replicate similar programs.

These objectives were appropriate and relevant to the issues confronting the electricity sector in the early/mid-1990s, which remained heavily dependent on imported fossil fuels and faced serious generation capacity constraints. These constraints have been eased since 1997 as new and more fuel-efficient generating plants have come on stream, reducing the attractiveness of DSM measures for the Jamaica Public Service Company, Ltd. (JPS), the electric utility and implementing agency for this Project. However, electricity demand growth has remained robust, despite low and even negative GDP growth since the mid-1990s, thereby giving DSM programs a fresh impetus for the coming years as JPS capacity reserve shrinks.

In the Jamaican context, the Project was innovative as well as risky because there was no prior institutional capability to carry out DSM programs nor exposure of end-users to an energy-saving program.

3.2 Revised Objective:

No revisions.

3.3 Original Components:

As initially designed, the Project had six components:

- Measures to achieve electricity savings in commercial buildings;
- Electricity savings program for the residential sector;
- Assessment of potential energy savings in the industrial sector;
- Program monitoring, evaluation, and quality control;
- Institutional development of the DSM Unit set up to implement the Project; and
- Institutional development of related entities such as the Jamaica Bureau of Standards, the Natural Resource Conservation Authority, and local environmental NGOs.

Based on prior results, two renewable energy components were added in the final year of project implementation, i.e., (i) dissemination of solar water heaters to commercial (hotels) and residential consumers, thereby reducing demand for electricity; and (ii) pilot testing of solar photovoltaic systems for isolated rural communities that are unlikely to receive grid-supplied electricity in the foreseeable future. This was made possible through cost savings and the scaling back of other project components.

Assessment of Design

While adequate overall, the project design had two important inadequacies, which had a significant impact on project implementation. First, the project design should have incorporated greater autonomy for the

DSM Unit, backed up by an inter-institutional advisory board, to ensure that JPS's corporate goals did not constrain the objectives of the DSM program. Second, revolving fund arrangements should have been incorporated in all those components where project funds were on-lent to, and subsequently reimbursed by consumers who purchased efficiency enhancing equipment .

3.4 Revised Components:

Component; Cost; Rating

COMMERCIAL SECTOR; \$3,600,000; S

RESIDENTIAL SECTOR; \$1,400,000; S

INDUSTRIAL SECTOR; \$100,000; S

MONITORING, EVALUATION, QUALITY CONTROL; \$1,200,000.00; S

INSTITUTION BUILDING; \$1,200,000; S

3.5 Quality at Entry:

Satisfactory

4. Achievement of Objective and Outputs

4.1 Outcome/achievement of objective:

The Project has substantially achieved its objectives, by demonstrating considerable potential for saving electricity. For the residential sector, the energy savings mobilized indicate that there would be significant potential for additional savings at low cost, so the Project provides an adequate basis for extending the lighting, solar water heating, and solar P.V. programs on a larger scale. On the other hand, results in the industrial and commercial sectors are below expectations and the project experience indicates that important obstacles need to be overcome to attain substantial energy savings in these sectors. While this was not a primary project objective, the greenhouse gas reduction targets were not attained (14,000 tons instead of 86,000 tons as expected), largely because of the low participation rate among commercial consumers.

Public awareness of energy conservation and of environmental impacts of fossil fuel use was enhanced under the Project, which successfully involved relevant NGOs. The Project's institutional development objective was met through creating an indigenous capability for DSM activities, the first of its kind in the Caribbean, both within JPS and among major energy consumers, NGOs, and educational institutions. This was achieved through dissemination of best practices including for energy efficiency auditing. The acceptance in principle of the DSM Unit's business plan by JPS' senior management and the establishment of a revolving fund for financing energy-efficiency related expenditures provide some certainty that these achievements are sustainable.

For the above reasons, the ICR assesses the overall project outcome as satisfactory, despite the shortfall in meeting the electricity savings and emission reduction targets.

4.2 Outputs by components:

In physical terms, the Project's energy savings targets were 7 peak MW or 30,000 MWh by December 31, 1998, the original completion date. At the time of the mid-term review (November 1996), the contribution of the different components to the overall targets was revised to take account of implementation experience during the Project's first two years, but the final overall targets remained essentially unchanged. With hindsight, these targets were unrealistically high and should have been reviewed more thoroughly at the time of the mid-term review.

The Project only partially achieved its physical goals, essentially due to cutbacks in expected participation

by large commercial energy users related to the cut-off in funding by JPS and Inter-American Development Bank (IDB). At completion, the Project is estimated to have cut grid-based electricity demand by about 4MW and produced annual energy savings of about 13,000 MWh, about 60% and 40%, respectively, of the initial targets.

Residential Program: In terms of public impact, the residential lighting program was the most successful component of the Project. By the time of project closure, over 32,000 households participated in the program and almost 100,000 CFLs (costing about US\$1 million) had been sold to JPS consumers, thereby cutting peak demand by about 1.7MW. This component had a difficult start, with both poor consumer response to the pilot test and quality problems with the compact fluorescent lamps (CFLs). However, the DSM Unit's flexible and creative approach to promoting and marketing helped to overcome these problems, and by the end, the Project exceeded its initial targets. A consultants' review has concluded that the program was popular with consumers, satisfaction is high and a solid basis exists for replicating it on a larger scale, given that nearly 10% of JPS residential consumers participated in it. However, the financing of an expanded program would make it necessary that JPS transfer back to the DSM Unit some of the funds collected from consumers who purchased CFLs during the first phase of the Project.

Since the solar water heating program was completed only recently (late 1999), evaluation of the actual benefits could not be undertaken at this stage. However, a 0.6 MW reduction in peak demand is projected as result of the 300 SWHs installed in residential households. For this component, a revolving fund was set up to ensure that the repayments over two years are plowed back into funding an extension of the program.

Commercial Program: Energy audits of 15 large-volume commercial consumers were carried out by the DSM Unit and six of these consumers implemented the recommended energy efficiency measures. The major barrier to broader implementation was the lack of low-cost financing, the weakness of the Jamaican economy, and the inability of firms to self-finance the necessary investments. JPS' decision to reverse its prior commitment to pre-finance the necessary investments seriously affected this component. The commercial program is estimated to have produced energy savings of 3,700 MWh p.a. and 0.2MW of peak demand reduction.

Institutional development: The bulk of project expenditures and outputs relate to capacity building in DSM techniques through training, technical assistance, and consultants' advice. The DSM Unit has developed into a valuable resource of experienced and well-trained staff. The Project also channeled about US\$ 0.4mn to Natural Resource Conservation Authority (NRCA) and two NGOs (Jamaica Environment Trust and the National Consumers League) that participated in public awareness campaigns to promote energy conservation.

Program monitoring and evaluation: Because its nature as a pilot project - which was intended to serve as basis for larger DSM programs both in Jamaica and elsewhere - the project design attached considerable importance to monitoring and evaluation of results by independent consultants: 10% of project funds were allocated to this purpose. The results of each major component were reviewed and assessed by consultants who were not previously involved in project implementation. The information on energy savings obtained from these evaluations provide a useful basis for the DSM Unit to market its services to other potential clients in the future.

Project Components financed by other Sources

JPS provided approximately US\$3.0 million to cover the DSM Unit's personnel and administrative expenses, as well as funding for a public education campaign directed at residential and commercial

customers (US\$0.34 million).

IDB As part of an US\$80.0 million Energy Rehabilitation Loan, US\$4.0 million (later reduced to US\$2.6 million) were made available for dissemination of CFLs, retrofitting of the JPS head office, assessment of solar water heating and refrigeration options, and energy audits for commercial consumers.

Rockefeller Foundation US\$0.237million were made available for feasibility studies on cogeneration options and implementation of one project.

Canadian Trust Fund US\$0.16 million financed 19 assessments of large-volume industrial energy users. There was no investment follow-up by these users.

4.3 Net Present Value/Economic rate of return:

At appraisal, the cost-effectiveness of the proposed programs were evaluated using the societal, total resource cost (TRC), including taxes and subsidies, and participation tests, which are commonly used in North America to assess DSM programs. The resulting benefit/cost ratios were 1.47 for the societal test; 1.31 for the TRC test; and 3.5 for the participation test. Based on actual project data, the ex-post results are 4.52 for the societal test; 4.03 for the TRC test, and 7.78 for the total participation test. These results were achieved despite the scaling down of the Project, largely because the results from the residential component exceeded original assumptions by a considerable margin.

4.4 Financial rate of return:

N/A

4.5 Institutional development impact:

As result of substantial capacity building in DSM techniques that took place under the Project, the DSM Unit now constitutes a valuable resource of experienced and well-trained staff. Given that the Project has identified considerable potential for expanding DSM activities, there is a strong case for preserving and expanding the DSM Unit which contains a pool of expertise with the potential to apply its skills to future programs both in Jamaica and in other Caribbean countries.

The participation of NGOs in the Project proved to be useful to furthering the goals of DSM, while at the same time better equipping these agencies to pursue their own activities. However, the substantial assistance (US\$ 0.6mn of IDB loan funding) planned for the Jamaica Bureau of Standards to carry out energy efficiency tests and labeling of appliances and to disseminate building codes was eliminated due to the Government's failure to provide in time a site needed to construct laboratory premises, as well as lack of other counterpart resources.

5. Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of government or implementing agency:

International petroleum prices were low for most of the project period, thereby reducing the incentive to conserve energy. (It has not been possible to gauge the effect of the resurgence of this price since early 1999.) No other significant factors outside the control of the Government or the implementing agency affected project implementation.

5.2 Factors generally subject to government control:

The macroeconomic deterioration since the mid-1990s and attendant financial crisis greatly reduced the willingness and ability of industrial and commercial consumers to invest in energy efficiency investments. At the time of appraisal, annual GDP growth was projected at 3.5% and energy demand was projected to increase at about the same rate. Instead, the Jamaican economy experienced stagnation and even decline for the past several years (while electricity demand continued to increase at about 5%p.a.), which altered

the context within which the Project was implemented.

The Government was supportive in principle of energy efficiency programs but provided little effective assistance. It was not until the end of the Project that the Government through the Ministry of Mining and Energy (MME) exerted pressure on JPS to pursue DSM programs.

There was insufficient involvement of other energy sector entities or major consumers in monitoring and supporting the DSM Unit's activities. The Unit depended almost entirely upon JPS senior management and external donors to set its priorities and finance its work program. As such, the Unit did not benefit from the guidance of many important players in the Jamaican energy scene. The Unit was over-reliant on the sole commitment of JPS, which was not always forthcoming.

According to larger energy users, the lack of attractive financing or tax relief for energy efficiency investments has deterred investment in efficiency enhancing equipment. Interest rates on local borrowing in Jamaica were very high during the project period and in conjunction with the sluggish business environment, they were a major reason for the poor response by individual and commercial energy users.

5.3 Factors generally subject to implementing agency control:

In the initial financing plan for the Project, JPS committed itself to provide US\$4.3mn in local currency, and would have been the single largest contributor project financing. However, the implementation period coincided with an electricity tariff freeze, which was aggravated by JPS' financial crisis in 1995-96 resulting from the accidental destruction of a significant part of its generation capacity. JPS was forced to reduce its financial contribution to the project component for large-volume commercial consumers. This led to a sharply lower participation rate of the largest energy users and thus, a disproportionate shortfall in overall energy savings resulting from the Project.

During project implementation, JPS management exhibited an uneven degree of commitment to DSM goals. Initial support during project preparation and the early implementation phase was high, given JPS generation capacity constraints at that time. However, the justification of DSM programs within JPS became more difficult once supply bottlenecks were removed after two new IPPs initiated service. Nor did JPS integrate DSM programs into its long-term load forecasting and generation expansion planning.

5.4 Costs and financing:

The Project was completed at a cost of US\$9.85 million, 21 percent below the appraisal estimate of US\$12.5 million and 5 percent below the - revised - mid-term review estimate. This reduction occurred both because JPS and IDB reduced their contribution to project funding (due primarily to the requirements to allocate funds to repair the Old Harbour generating plant damaged in mid-1994) and costs of several activities were lower than originally estimated. The GET grant financed US\$ 3.57 million; the IDB loan, US\$2.68 million; the grants from the Rockefeller Foundation and Canadian Trust Fund, US\$0.20 million and US\$0.15 million, respectively; and JPS, US\$3.25 million. Toward the end of the Project, funds were reallocated from consulting services and training to pilot projects for solar water heating and solar PV.

6. Sustainability

6.1 Rationale for sustainability rating:

The Project's sustainability is assessed as uncertain because the institutional arrangements for future DSM activities in Jamaica as yet have not been clearly defined in terms of their scope and location. While supportive of DSM activities, the Government in general and MME in particular do not yet have an explicit DSM policy as part of its overall energy sector strategy or a vision for the future role of the DSM Unit. Several alternative institutional arrangements have been mooted and a decision by Government and JPS is

urgently needed on the future importance of DMS in general and the role of the DSM Unit in particular.

6.2 Transition arrangement to regular operations:

At present, JPS continues to pay the salaries of the DSM Unit staff and its operating costs. JPS intends to keep the DSM Unit as a distinct entity but integrate the Unit more closely into its mainstream activities, pending a final government decision. However, DSM activities may not always be compatible with JPS' corporate goal of maximizing electricity supplies, in terms of coverage and per-capita consumption. In order to build on the achievements of the Project and to sustain the present public interest in CFLs, solar water heater (SWH) and solar PV systems, it is essential that JPS and/or other sources provide the DSM Unit with adequate funding to pursue these programs.

The DSM Unit has indicated that with adequate funding, it would be feasible, over a three-year period, to disseminate a further 200,000 CFLs to residential users, and about 3,000 SWHs and 1,000 solar PV systems in remote rural households. These targets need to be firmed up as part of the Unit's business plan. Once approved and costed, they would be the basis for assessing the Unit's performance in the next two - three years.

Further project monitoring by the World Bank in the next six - twelve months is recommended as part of the dialogue with the Government, in order to assist in ensuring the sustainability of the DSM Unit and in defining its future range of interventions. The value of the Project as "demonstration" of the potential for DSM programs in Jamaica and elsewhere also depends on a review by GET and the Bank of possible follow-on activities of this nature in other Caribbean countries.

7. Bank and Borrower Performance

Bank

7.1 Lending:

The Project's objectives fitted well into the prevailing sectoral objectives of reducing generation capacity shortages, and the Government's overall objectives to minimize its fuel import bill and reduce power plant emissions. Preparation and appraisal were thorough, although the design of the procurement arrangements imposed an excessive degree of prior Bank scrutiny. Arrangements for more ex-post reviews of procurement decisions would have helped to reduce the extent of micro-management by the Bank's task managers that resulted from the need for prior clearance of even nominal expenditures. Finally, the appraisal did not sufficiently recognize the risk of: (i) non-implementation of efficiency audit recommendations due to financial constraints; and (ii) uneven commitment by JPS management to DSM goals.

7.2 Supervision:

Overall, project supervision by the Bank was satisfactory, with nine missions in five years that provided the required expertise. However, there should have been more intensive supervision during the first two years of the Project when substantial delays in project start-up and changes in management of the DSM Unit occurred. At that time, other - considerably larger and more complex - Bank-financed projects and major sectoral policy issues (such as JPS privatization) dominated staff and borrower attention. The Project also suffered from a rapid turnover in task managers during 1996-98 and a hiatus in task management in late 1997 and early 1998. Thereafter, closer supervision by the Bank ensured that the demonstration components proposed by the DSM Unit were implemented expeditiously and the Project was completed within the extended closing period, with nearly all available funds being utilized.

7.3 Overall Bank performance:

On account of adequate project preparation and supervision, the Bank's overall performance is rated satisfactory.

Borrower

7.4 Preparation:

The Project was based on the recommendations of an ESMAP study on energy efficiency options (e.g. building codes; equipment labeling) and work by the Conservation Law Foundation and Rockefeller Foundation which recommended pilots for enhancing energy efficiency of commercial users. A PPF was granted for project preparation undertaken by consultants.

7.5 Government implementation performance:

While the Government's energy policy document acknowledged the importance of energy efficiency enhancement, the Project did not receive the necessary effective support from MME whose participation in the Project was generally limited to monitoring progress. An urgent decision by the Government is needed on the institutional arrangements for future DSM activities in Jamaica.

7.6 Implementing Agency:

DSM Unit: Project execution was slow in the first two years but accelerated considerably later. Unit management and staff were committed to making the Project a success, and showed initiative in seeking solutions to the difficulties encountered during implementation. Project results were satisfactory overall, despite the cutback in JPS' financial contribution. However, the Unit should have been more proactive toward the end of the Project to ensure the sustainability of its operations beyond project completion.

JPS: JPS management exhibited uneven support to DSM. The decision to reduce its financial support to the program, although understandable in the circumstances, impeded the Project's impact on the commercial and industrial sectors and thus reduced the degree to which the energy savings targets could be met. Toward the end of project implementation, JPS did not actively explore alternatives for transforming the DSM Unit into an energy services company, which has added to the uncertainties about the Unit's future.

7.7 Overall Borrower performance:

Satisfactory on balance, on the strength of the DSM Unit's performance, notwithstanding the lack of effective government support.

8. Lessons Learned

The key lessons that can be drawn from this Project are:

- A supportive policy environment, through strong and proactive commitment by the Government and the major energy sector entities, is essential for DSM programs to succeed;
- There is a potential conflict between a narrow goal of maximizing electricity supplies and a DSM program;
- The institutional arrangements for DSM programs need to ensure that the implementing agency has adequate managerial and financial autonomy;
- Public awareness and promotional campaigns are critical to the success of DSM programs;
- Energy efficiency audits in the industrial, commercial, and residential sectors need to be accompanied by appropriate financing, if there is to be adequate investment follow-up to the audit recommendations; and
- Prospects for sustainability are enhanced if revolving fund mechanisms to recycle consumer repayments are incorporated in the project design and adhered to.

9. Partner Comments

(a) Borrower/implementing agency:
See attached.

(b) Cofinanciers:
None received.

(c) Other partners (NGOs/private sector):
None received.

10. Additional Information

Map IBRD 30858

Annex 1. Key Performance Indicators/Log Frame Matrix

Outcome/Impact Indicators

Indicator/Matrix	Projected in last PSR	Actual/Latest Estimate
Energy savings of 7 peak MW or 30,000 MWh	N/A	Energy savings of 4 peak MW 13,000 MWh
Reduction of CO2 emissions by 88,590 tons	N/A	Reduction of CO2 emissions by 14,000 tons

Output Indicators:
JAMAICA: DSM – Electricity Savings Targets and Achievements
(MW, MWh, Tons of CO2 emissions)

Indicator /Matrix	Projected in last PSR			Actual/Latest Estimate		
	TARGETS (ANNUAL)*			ACHIEVEMENTS (ANNUAL)		
	Mw Peak Demand	MWh	CO2 Emission Reductions (Metric Tons)	MW Peak Demand	MWh	CO2 Emission Reductions (metric Tons)
Residential Phase 1	0.002	18	21.0	0.005	58.0	6.0
Residential Phase II	1.000	4,393	5,228	1.67	5,437	6,470
Large Commercial Retrofits – New Construction	5.700	4,479	11,660	0.278	3,788	4,500
Small Commercial	0.001	51	61	0.04	111	132
SWH Residential	(Combined with Commercial)	-		0.56	274	326
SWH Commercial	0.170	157	187	-	608	724.55
Solar PV	-	-	--	N/A	7	8
Total	6.720	9,098	17,157	2.553	10,313	12,166

*Original Five Year Cumulative Targets have been annualized to facilitate comparison with achievements which were estimated on an annual basis. This was necessary because most of the programs were not implemented until late 1998 and 1999.

Annex 2. Project Costs and Financing

Project Cost by Component (in US\$ million equivalent)

Project Cost By Component	Appraisal Estimate US\$ million	Actual/Latest Estimate US\$ million	Percentage of Appraisal
Commercial Sector	3.56	0.96	26.97
Residential Sector	1.38	1.43	103.62
Industrial Sector Assessment	0.15	0.15	100
Programs Monitoring and Evaluation and Quality Control	1.18	0.35	29.66
DSM Unit Institutional Building & Administrative Costs	4.20	6.57	156.43
Institutional Strengthening	0.79	0.39	49.37
Total Baseline Cost	11.26	9.85	
Physical Contingencies	1.24		
Total Project Costs	12.50	9.85	
Total Financing Required	12.50	9.85	

Project Costs by Procurement Arrangements (Appraisal Estimate) (US\$ million equivalent)

Expenditure Category	ICB	Procurement Method¹			N.B.F.	Total Cost
		NCB	Other²			
1. Works	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
2. Goods	0.00 (0.00)	1.12 (1.12)	0.06 (0.00)	4.84 (0.00)	6.02 (1.12)	
3. Services	0.00 (0.00)	2.62 (2.62)	0.00 (0.00)	2.27 (0.00)	4.89 (2.62)	
4. Miscellaneous	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	1.59 (0.00)	1.59 (0.00)	
5. Miscellaneous	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	
6. Miscellaneous	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	
Total	0.00 (0.00)	3.74 (3.74)	0.06 (0.00)	8.70 (0.00)	12.50 (3.74)	

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (US\$ million equivalent)

Expenditure Category	ICB	Procurement Method ¹		N.B.F.	Total Cost
		NCB	Other ²		
1. Works	0.00 (0.00)	0.80 (0.80)	0.00 (0.00)	0.80 (0.00)	1.60 (0.80)
2. Goods	0.00 (0.00)	0.54 (0.54)	0.00 (0.00)	1.27 (0.00)	1.81 (0.54)
3. Services	0.00 (0.00)	1.46 (1.46)	0.34 (0.00)	0.75 (0.00)	2.55 (1.46)
4. Miscellaneous	0.00 (0.00)	0.00 (0.00)	3.88 (0.00)	0.00 (0.00)	3.88 (0.00)
5. Miscellaneous	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
6. Miscellaneous	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Total	0.00 (0.00)	2.80 (2.80)	4.22 (0.00)	2.82 (0.00)	9.84 (2.80)

^{1/} Figures in parenthesis are the amounts to be financed by the Bank Loan. All costs include contingencies.

^{2/} Includes civil works and goods to be procured through national shopping, consulting services, services of contracted staff of the project management office, training, technical assistance services, and incremental operating costs related to (i) managing the project, and (ii) re-lending project funds to local government units.

Project Financing by Component (in US\$ million equivalent)

	Appraisal Estimate			Actual/Latest Estimate			Percentage of Appraisal		
	Bank	Govt.	CoF.	Bank	Govt.	CoF.	Bank	Govt.	CoF.
Commercial Sector		2.72	0.84			0.96	0.0	0.0	114.3
Residential Sector			1.38			1.41	0.0	0.0	102.2
Industrial Sector			0.15			0.15	0.0	0.0	100.0
Assessment									
Program Monitoring and Evaluation Control	0.59		0.59	0.35			59.3	0.0	0.0
DSM Unit Institutional Building and Administrative Costs	2.27	1.36	0.57	2.84	3.22	0.53	125.1	236.8	93.0
Institutional Strengthening	0.19		0.60	0.39			205.3	0.0	0.0
Contingencies	0.75	0.23	0.26	0.00			0.0	0.0	0.0
Total	3.80	4.31	4.39	3.58	3.22	3.06	94.2	74.7	69.7

Annex 3: Economic Costs and Benefits

Economic rate of return Benefit/Cost Ratio	Appraisal	Actual
Societal Test	1.47	4.52
Total Resource Cost Test	1.31	4.03
Participant Test	3.86	7.78

Annex 4. Bank Inputs

(a) Missions:

Stage of Project Cycle Month/Year	No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.)		Performance Rating	
	Count	Specialty	Implementation Progress	Development Objective
Identification/Preparation September 1992	2	1 Sr. Financial Analyst, 1 Energy Efficiency Specialist (Consultant)		
7/18-7/30/1993	4	1 Sr. Financial Analyst, 1 Energy Specialist, 2 Consultants		
Appraisal/Negotiation 10/4-10/24/1993	4	1 Sr. Financial Analyst, 1 Energy Specialist, 1 Consultant, 1 Procurement Specialist		
Supervision 10/26/1994	3	1 Sr. Financial Analyst, 2 Consultants	S	S
6/7-6/14/1995	2	1 Sr. Financial Analyst, 1 Consultant	S	S
11/5-11/17/1995	1	1 Sr. Financial Analyst	U	U
3/5-3/9/1996	1	1 Sr. Power Engineer	S	S
7/21-7/24/1996	1	1 Sr. Operations Officer	S	S
11/17 -12/2/1996	2	1 Sr. Operations Officer, 1 Sr. Power Engineer	S	S
5/2-9 1997	2	1 Sr. Operations Officer, 1 Sr. Power Engineer	S	S
5/4-5/13/1998	3	1. Sr. Energy Economist, 1 Sr. Operations Officer, 1 Sector Leader	S	S
9/27-10/3/1998	2	1 Sr. Energy Economist	S	S
3/28 - 4/2/ 1999		1 Sr. Energy Economist, 1 Energy Efficiency Specialist	S	S
12/2-12/8/1999	1	Sr. Energy Economist	S	S
ICR 1/31-2/7/2000	2	1 Sr. Energy Economist, 1 Energy Efficiency Specialist (Consultant)	S	S

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US\$ (,000)
Identification/Preparation	24.2	69.0
Appraisal/Negotiation	5.8	16.8
Supervision	68.8	209.1
ICR	10.0	37.5
Total	108.8	332.4

Annex 5. Ratings for Achievement of Objectives/Outputs of Components

(H=High, SU=Substantial, M=Modest, N=Negligible, NA=Not Applicable)

- | | <i>Rating</i> | | | | |
|--|-------------------------|--------------------------|------------------------------------|-------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> <i>Macro policies</i> | <input type="radio"/> H | <input type="radio"/> SU | <input type="radio"/> M | <input type="radio"/> N | <input checked="" type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Sector Policies</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Physical</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Financial</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Institutional Development</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Environmental</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |

Social

- | | | | | | |
|---|-------------------------|--------------------------|------------------------------------|-------------------------|--------------------------|
| <input checked="" type="checkbox"/> <i>Poverty Reduction</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Gender</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input type="checkbox"/> <i>Other (Please specify)</i> | | | | | |
| <input checked="" type="checkbox"/> <i>Private sector development</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input checked="" type="checkbox"/> <i>Public sector management</i> | <input type="radio"/> H | <input type="radio"/> SU | <input checked="" type="radio"/> M | <input type="radio"/> N | <input type="radio"/> NA |
| <input type="checkbox"/> <i>Other (Please specify)</i> | | | | | |

Annex 6. Ratings of Bank and Borrower Performance

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HU=Highly Unsatisfactory)

6.1 Bank performance

Rating

Lending

HS S U HU

Supervision

HS S U HU

Overall

HS S U HU

6.2 Borrower performance

Rating

Preparation

HS S U HU

Government implementation performance

HS S U HU

Implementation agency performance

HS S U HU

Overall

HS S U HU

Annex 7. List of Supporting Documents

See Project file for:

Global Environment Trust Fund Grant Agreement June 1, 1994

Memorandum and Recommendation of the Director, Latin America and Caribbean Country Department III, to the Regional Vice President, March 1, 1994

Supervision Mission reports, 1994-99

ICR Mission back-to-office report, February 11, 2000

**DSM Project Review for the period
June 1994 to December 1999**

A Review of the Project Targets, Achievements and Lessons Learnt

Presented to the World Bank

March 13, 2000

**Demand Side
Management
Unit**

Executive Summary

The Jamaica Public Service Company developed a Demand Side Management Demonstration Project in collaboration with the Inter-American Development Bank, the Global Environment Trust Facility/World Bank (trustee), the Rockefeller Foundation, and the Canadian Trust Facility/IDB (trustee).

The total project cost was originally estimated at US\$12.5 million, with the IDB Loan 605/OC-JA providing US\$4.0 million, the Rockefeller Foundation providing a grant of US\$237,000, the Canadian Trust Fund providing a grant of US\$150,000, the World Bank/GET Facility providing a grant of US\$3.8 million and parallel financing by JPSCo of US\$4.31 million. The total project cost was revised to US\$10.37 million subsequent to the Mid-term review undertaken by the World Bank over the period November 17- December 2, 1996. The final date for disbursement under IDB's Loan Contract was February 1999, and the closing date for the World Bank/GET grant was December 31, 1999. Total disbursement under the GET Grant as of December 31, 1999 was US\$3.568 million.

Project Objectives

The principal objectives of the project were to: (i) save fuel consumption; (ii) defer generation capacity expansion; (iii) reduce emissions of greenhouse gases; (iv) build institutional capability in the Jamaica electric power sector and the energy-related private sector; (v) support the ongoing efforts in testing and adopting energy efficient equipment; (vi) increase public awareness; (vii) demonstrate the potential gains to utilities of other developing countries; (viii) provide cost savings to JPSCo and participating customers; and (ix) expand the use of new technologies in Jamaica. The project had an energy savings target of about 7 peak MW and 30,000 MWh by 1999. Additionally, the project included institutional strengthening for the JPSCo DSM Unit, and other institutions such as the Jamaica Bureau of Standards (JBS), Natural Resource Conservation Authority (NRCA), Jamaica Environment Trust (JET) and other Non-Governmental Organizations (NGOs).

•Demand Side Management Demonstration Project

Project Implementation Performance

The Demand Side Management Unit, within the Corporate Services Division executed the Project, which became effective on June 1, 1994. Cooperation in the implementation and enhancement of individual DSM programme plans was provided by the Jamaica Environment Trust, the National Consumers' League, the United Consumers in Action, and the Natural Conservation Resource Authority. The Jamaica Bureau of Standards was also involved in the testing of energy efficiency lighting equipment and in providing information on Solar Water Heating Standards and Energy Efficiency Building Codes and Standards.

The programmes falling under the umbrella of the Demand Side Management Demonstration Project were as follows:

- Residential Phase I and II,
- Small Commercial Phase I and II,
- Large Commercial Retrofit,
- Large Commercial New Construction,
- Assessments of Solar Water Heating, Refrigeration and Air Conditioning systems, and
- Cogeneration component targeted to hotels and industrial facilities.
- Solar Water Heating Pilots in the Commercial and Residential Sectors
- Photovoltaic Pilot Programme in two rural villages

This report provides an encapsulated review of the Demand Side Management Demonstration Project by outlining the main project targets, accomplishments, lessons learnt and recommended actions to enhance the project's future sustainability.

The Project faced several risks to the realization of projected benefits. These were technical, institutional and market. The technical risks relate to the issues surrounding the unique characteristics of the power in Jamaica which is supplied at 110V, 50Hz. The institutional risks relate to the ability to adequately staff the DSM Unit, and supporting areas. The market risks relate to the possibility of weak interest or participation in DSM programs, which would affect penetration and savings targets.

A major factor contributing to the slow pace of implementation during the first two years was the deterioration in JPSCo's cash flow, which was aggravated by the June 3, 1994 explosion at the Old Harbour Power Station. This situation was further compounded by the fact that the Government decided not to award a rate increase at the time. Consequently, expenditures were restricted to essential core functions only which impacted on the timely hiring of staff for the DSM Unit.

•Demand Side Management Demonstration Project

Achievement of Project Objectives

Residential Phase I and II programmes

The Residential Phase I and II energy-efficiency programs were launched in March 1994 and February 1996, under the umbrella theme " Power Saver Programmes - increasing energy efficiency and building awareness." These programmes provided customers with new energy efficient compact fluorescent lamps, low flow showerheads, faucet and sink aerators, refrigerator gasket replacement kits and technical assistance in appliance operation and maintenance. The Phase I programme was a direct installation delivery method and Phase II was implemented through a direct contact delivery method At JPSCo commercial offices over a three -year period.

Residential Phase 1 Programme

- Provision of compact fluorescent lamps (CFLs) and other energy efficient devices at no cost to 100 participants. The group of 100 participants was selected via an Essay Competition conducted for students between the ages of 10 and 18. Both winning students and their teachers were selected.
- The objective was to establish the technical criteria regarding equipment performance, customer response and installation problems.
- Engineering estimates exceeded the original targets of 2kW and 18,000 kWh. The programme resulted in reduced annual energy use of 58,021 kWh and peak coincident demand reduction of 5.2 kW and saving of 835,965 gallons of water each year. JPSCo's school based publicity strategy generated a great deal of press coverage as well as contact with students, teachers, and parents, concerning changes in appliance usage patterns and purchasing habits. Pilot participants expressed a high level of satisfaction with the products and services received. Feedback from customers was used to enhance the design and development of the Residential Phase II Programme.

Residential Phase II Power Saver Programme

The second phase of the residential power saver programme sought to increase the saturation of high-efficiency electrical equipment, boost consumer demand, and the commercial viability of the equipment in the residential market.

This programme involved the provision of energy efficiency measures to 30,000 customers at a discounted price. Implementation was carried out over a three-year period, 1996-98. Contact was made with customers directly at JPSCo commercial offices. The

•Demand Side Management Demonstration Project

aim was to solicit participation from customers through our customer service offices island-wide

This was the first time that JPSCo had embarked on a project of this type. In particular, the development of new accounting procedures and a computerized subsystem was complex and encountered many delays. As a result, this impacted severely on the ability of the DSM Unit to respond to customer needs in the early stages of the programme. For instance, the subsystem required frequent modifications to the database tracking programme by the IS department. This affected the implementation of the computer subsystem in the Customer Service Offices through the non-programming of cash-receipting machines. The DSM Unit was also constrained by this deficiency in that the database tracking system was at first limited. The link to the mainframe, which facilitated the approval of customers for the programme, was frequently out of service, resulting in further delays.

The distribution of equipment to various JPSCo Customer Service Offices island-wide was at first tardy and the DSM Unit had to exert additional coordination efforts in this area.

At the end of December 31 the target of 30,000 participants were achieved.. The programme's original savings targets of 1.0MW and 4,393 MWh/ year were substantially exceeded with actual savings of 1.67MW and 5,437 MWh respectively.

Commercial Components

The Commercial program components were launched in October 1996, after much preparation and the dissemination and review of programme plans. These programmes are more complex than the residential programmes because they are hinged on the Energy Efficiency Building Code, which was only available for dissemination in January 1996. The Jamaica Bureau of Standards held their first training course since the official printed copies were available in the beginning of October 1996. Prior to the Launch, the DSM Unit was not only involved in developing the programs but also in recruiting and training additional persons to carry out the implementation and direct contact marketing required to realize healthy participation rates. Details on these programmes are presented below.

Large Commercial Retrofit Programme

This programme was a major facet of the commercial-sector component of the Project. The objectives of this programme were:

- establishing of technical potential for energy conservation in the large commercial sector;
- demonstration of the means for achieving conservation in large existing buildings;

•Demand Side Management Demonstration Project

- establish the steps that will be taken - and the resources - required to foster conservation in the large commercial sector cost effectively on a broad scale;
- achieve a limited amount of energy conservation savings commensurate with the program budget - peak shaving of 2.72 MW for the utility and an energy savings of 11,907 MWh for the customers were targeted.
- increase customer awareness of energy saving measures and reduce technical risk.

The programme design involved the provision of financial incentives for the implementation of energy efficiency measures in 13 large commercial facilities (in the R40 and R50 rate class).

An energy auditing consulting firm, DSE Consultants Inc., of Canada completed energy audits of fifteen large facilities. The quality of the audits and recommendations were of a high standard. Implementation achievements were, however, severely curtailed by the decline of the Jamaican economy and the concomitant scarcity of relatively cheap capital. The adoption of new energy efficient technologies was further limited by JPSCo's corporate decision to withdraw offers of financing for large customers and minimize financing subsidies to small customers. At the end of the programme on December 31, 1999, six facilities had completed installations of energy efficiency retrofits resulting in estimated energy savings of 3,703 MWh equivalent to cost savings of US\$978,504.

Large Commercial New Construction Programme

This programme involved the provision of financial incentives for the implementation of energy saving devices in seven (7) new large commercial facilities (in the R40 & R50 rate class). The programme had several broad objectives which included :

- Establishing the technical potential for conservation as well as the likely market penetration in the large commercial new construction sector.
- Providing information and technical assistance to help builders, architects, engineers, and developers early in the planning and design stages of new commercial buildings to maximize the level of achievable savings.

The programme had a specific goal of reducing the peak utility demand by 3.07 MW and conserving 9,459 MWh.

A listing of all new commercial buildings for construction islandwide, approved by the relevant Parish Councils, was developed in-house. From this listing 47 buildings met the criterion of size ($>1000\text{m}^2$). Letters were sent to these developers and owners informing them about the New Construction Programme and inviting them to express interest in participating. A mailing soliciting participation was also made to architects and engineers

•Demand Side Management Demonstration Project

for buildings not captured in the above method. A total of 15 responses, were received and these were invited to attend the October 25 launch.

However, given the depressed state of the economy, new construction activities were practically non-existent in the commercial sector.

Small Commercial Direct Installation Program.

The Small Commercial Programme sought to give businesses a boost by offsetting operating costs with the provision of financial and technical assistance to owners of existing buildings under 1000 square metres in size. The small buildings (R20) tariff class represents the most commercial customers in Jamaica. A major objective of the programme was to determine the technical potential and market penetration for conservation in the small commercial sector.

The programme was launched as a part of the Commercial 'Power Plus' Programme on October 25, 1996. Ten small commercial (R20) facilities were targeted for audits and retrofitting. Under this programme, selected facilities received financing to purchase state-of-the-art energy-efficiency measures at attractive interest rates. JPSCo also provided funding to reduce the payback period of the recommended measures to three years, based on data gathered during the site audit. The customer will therefore pay only a portion of the total cost.

The energy audits were conducted free of cost, and the energy efficiency measures installed directly by a contractor provided by JPSCo. Under the programme ten facilities were retrofitted with estimated energy savings of 111,268 kWh and demand savings of 41kW.

Technology Assessments

The DSM Demonstration Project features four Technology Assessment studies:

- Solar Water Heating
- Industrial-Sector Efficiency-Enhancement
- Refrigeration Efficiency-Enhancement
- Air Conditioning Efficiency-Enhancement

The basic purposes of these studies were: (1) to identify the segment-specific market potential for one or more energy-efficiency technologies that could be promoted within one or more applicable market segments, and (2) if the results of Step 1 are favorable, to develop an appropriate Pilot Programme to promote the technology(ies) on a limited scale, to gain actual experience with customer reactions, acceptance barriers, etc. All studies have been satisfactorily completed.

•Demand Side Management Demonstration Project

Solar Water Heater Commercial Programme

This programme involved the supply, installation and maintenance of solar water heating systems in approximately 15 hotels, primarily to promote the use of solar energy and to test the technical efficiency, customer acceptance and cost-effectiveness of commercial solar applications. Two contracts were awarded to undertake this activity, Solar Dynamics (EC) Ltd. and (2) Energy Services and Products Ltd. Participants will repay costs through electricity bill over three -year period in order to create a revolving fund for future solar activities.

The programme has been moderately successful with (13) thirteen facilities participating in the programme, encompassing large and small hotels as well as student accommodation halls of residence at the University of the West Indies.

Solar Water Heating Residential Programme

The Residential Solar Programme involved the installation of solar water heating systems in 300 domestic households. Participating customers will repay the cost of each system over a two-year period on electric bill., thereby establishing a revolving fund for future interventions in the solar water heating market.

As of November 30, 1999, the contractor Isratech Jamaica Ltd., had installed all 200 solar water-heating units. The programme had been very successful. Approval was subsequently given by the World Bank to expand the programme to include another 100 installations. These additional units have also been installed. Plans are currently underway to expand the programme through the revolving fund to be established, during fiscal year 2000.

Photovoltaic Pilot Programme

This programme represented a pioneering effort at using environmentally benign technology to provide energy to isolated rural villages as a cost-effective complement to traditional grid expansion. The programme involved the installation of photovoltaic equipment (panels, cables, batteries and inverter) in about forty homes in small remote rural villages. Two villages were targeted, 28 homes in Middle Bonnett in St. Catherine and 14 homes in Ballymony in St. Ann.

Implementation was undertaken by a local contractor Automatic Control Engineering Ltd. and completed by December 31, 1999. A solar powered streetlight and lighting for the local church was also installed at Middle Bonnett.

•Demand Side Management Demonstration Project

Project Sustainability

A business plan has been prepared by the DSM Unit, which charts the way for the future sustainability of energy efficiency activities. It is proposed that the existing DSM Unit will continue to operate as a quasi energy services entity, fully owned by JPSCo, or by some type of joint venture arrangement between JPSCo and other public/private sector agencies. The principal performance indicators of the new DSM Unit will include inter alia;

1. Sale of 200,000 compact fluorescent lamps over a 3 year period.
2. Annual sale and maintenance of 1000 Domestic Solar Water Heaters over the next three years.
3. Sale of 1000 photovoltaic systems to rural homes over a three year period.
4. Provision of energy auditing, training and performance contracting services to the public and private sectors.
5. Installation and lease financing of solar water heating systems to 12 hotel/institutional facilities.

A energy performance-contracting pilot is planned with assistance from a North American Energy Services Company.

Bank Performance

The Bank demonstrated noteworthy flexibility in granting approvals for use of the GET financing for activities, which were not previously earmarked under the original financing plan. These included the residential and commercial solar water heating programmes, the photovoltaic pilot programme -the first of its kind in the English speaking Caribbean-, as well as assistance to corporate efforts to review the tariff structure and to reduce technical and non-technical losses. The quality of bank supervisory staff was in general of a very high standard and committed to the achievement of the goals of the programme as evident in support given for the granting of two extensions to the project's original closing date. On a broader level, efficiency gains in procurement administration would have resulted from greater decentralisation at the local level, for approvals of a plethora of relatively small expenditures.

Borrower Performance

Major delays in project implementation at the start of the project were a reflection of a confluence of unforeseen factors. Perhaps the most salient was the June 1994 explosion at the Old Harbour Power Plant, and the resultant cash flow deterioration. The latter impacted on the ability of DSM Unit to recruit staff and to provide financial incentives to commercial participants. Unfamiliarity with the modus operandi and procurement proclivities of donor agencies was also another initial factor.

•Demand Side Management Demonstration Project

On another level the DSM demonstration pilot contributed positively to the corporate public image and customers perception of the local utility, given the less than buoyant state of the economy.

Notwithstanding the initial delays the project gained substantial momentum in later years, achieving several objectives and targets.

Overall Assessment of Project Results

The Demand Side Management Demonstration Project achieved one of its major objectives, that of sensitising and generating public awareness of the benefits of energy efficiency. The contribution of the Jamaica Environment Trust (JET), The National Consumers League (NCL) and the Natural Resources Conservation Authority (NRCA) in the dissemination of information cannot be overstated.

Another major achievement was the significant institutional capacity building resulting from training on energy efficiency matters received by the staff of DSM Unit, other project stakeholders and participating customers. DSM staff has already replicated several of these training exposures to wider interest groups.

With regards to market transformation, the spill over benefits of the pilot programmes have been evidenced in substantial increased sales of energy efficient equipment by local vendors particularly compact fluorescent lamps, electronic ballasts and T8 tubes.



TEL: 926-9170 FAX: 9262835
ANY REPLY OR SUBSEQUENT REFERENCE
TO HIS COMMUNICATION SHOULD BE
ADDRESSED TO THE PERMANENT
SECRETARY AND THE FOLLOWING
REFERENCE QUOTED:-

MINISTRY OF MINING & ENERGY
36 TRAFALGAR ROAD
KINGSTON 10, JAMAICA

May 30, 2000

Mr. Joerg-Uwe Richter
Senior Economist
LCSFP
The World Bank
Washington D.C.

Dear Mr. Richter:

Energy Demand-Side Management Pilot Project

I have read with interest the draft **Implementation Completion Report** and have found it to be quite frank and reflective of the way in which the project was implemented as well as the results obtained. I agree with your findings in regard to the fact that the energy conservation opportunities presented to fifteen members of the industrial sector were not fully exploited because of a lack of sufficiently attractive funding.

In regard to the claim by some large energy consumers that there is a lack of tax relief for energy efficiency investments, I have to alert or remind you that **Energy Saving Devices** are zero-rated for purposes of the General Consumption Tax. The following is an extract from the **Tax Guide** which has been published for general information:

ITEMS WHICH ARE ZERO RATED

Group 13 - Energy Saving Devices

1. The following Lighting Equipment
 - (a) compact fluorescent lamps and ballast;
 - (b) fluorescent fixtures and tubes;
 - (c) circular fluorescent lamps;
 - (d) fluorescent ballasts;
 - (e) high intensity discharge fixtures and tubes
 - (f) fibre glass panels for skylighting.

2. *Automated, electronic or computerized lighting control systems including occupancy sensors and photo-cells for such systems.*
3. *Solar panels and tubes for solar water heating systems.*
4. *Solar cells designed to produce electricity from the sun.*
5. *Apparatus or machinery designed to produce motive power, heat, light or electricity through the utilization of renewable sources of energy, for example, sun, wind and water.*

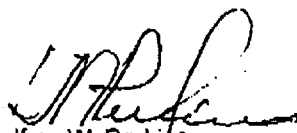
In addition, the Customs Duties on these items have also been effectively reduced from 20% to 5%.

On the matter of the DSM Unit, the position of the Government in general and the MME in particular is that the Unit shall continue to operate on a long-term basis. Bearing in mind the apparent contradictions in having such a unit to be fully dependent on the power utility, the arrangement will be for the Petroleum Corporation of Jamaica to play a majority role in the future operation of the Unit. The mechanism (Energy Service Company?) has not yet been finally decided but you will be further advised.

The pilot-scale achievements of the Demand Side Management Project have been so convincing in regard to the efficient use of energy, the containment of energy costs at both the micro and national level and in terms of alternative energy development that Jamaica must continue with its implementation. The primary question is a matter of sufficiently attractive funding to hold the interest of consumers, including the large users. Even if the Jamaica Public Service Company returned to the DSM Unit some of the funds from the sale of CFLs, more financial support will be required to establish an independent DSM entity firmly on its feet. I believe that the World Bank can be of considerable assistance in this regard and I urge you to consider this.

Kindly accept my sincere apologies for such a delay in this response. I had hoped to be able to be more specific in regard to institutional arrangements for the future of the DSM Unit.

Yours sincerely,



Godfrey W. Perkins
Permanent Secretary.

MAP SECTION

