

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT  
GOVERNMENT OF JAMAICA  
ENERGY SECTOR ASSISTANCE PROJECT

QUARTERLY PROGRESS REPORT NUMBER VI  
for the period April - June, 1984  
USAID Contract Number 532-0065-C-00-3007-00  
USAID Project Number 532-0065

PREPARED BY

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JAMAICA ENERGY SECTOR ASSISTANCE PROJECT  
 QUARTERLY PROGRESS REPORT NUMBER SIX  
 META SYSTEMS, INC.  
 Primary Technical Assistance Contractor

1. PROJECT UPDATE, OBSERVATIONS AND RECOMMENDATIONS

A. Summary of Project Status

1. Actual savings and expenditures

During the reporting period, there was a noticeable reduction in project accomplishments. Several factors contributed to this reduction, including:

- Reduction in new contracts awarded near end of financial year due to budget limitations;
- Changes in importation and foreign exchange licensing procedures by Bank of Jamaica;
- Changes and uncertainties in the exchange rate of the Jamaican dollar;
- Project budget cuts and uncertainties as to true project budget;
- Changes in approval systems, project priorities, and revisions to procedures made by the Project Director.

The energy conservation activity is summarised below.

ENERGY CONSERVATION APRIL - JUNE, 1984

	<u>Previous Qtr.</u>	<u>This Qtr.</u>	<u>Total Project</u>
"Full-scale" audits completed	6	1	32

## Energy Conservation April - June, 1984 contd.

	<u>Previous Quarter</u>	<u>This Qrt.</u>	<u>Total Project</u>
"Lighting" audits completed	9	0	9
"One day" audits completed	0	0	20
Expenditure for audits (JA\$)	\$ 73,131	5,000	230,000
Expenditure for retrofits completed (JA\$)	651,000	157,000	1,027,000
Commitment for retrofits in progress (JA\$)	465,000	308,000	308,000
Savings from completed retrofits (JA\$/yr)	1,665,000	291,000	2,305,000
Savings from completed retrofits (BOE/yr)	8,162	2,572	14,768
Facilities receiving completed retrofits	8	5	19

No new spin-off projects were claimed during the quarter.

Savings from completed spin- offs (BOE/yr)	2,000	0	8,207
Savings from completed spin- offs (JA\$/yr)	350,000	0	865,000

Problems were encountered with the six major solar installations awarded last quarter. The contracts were awarded based on importation of overseas equipment by GOJ and USAID for the contractors. However, changes in the Bank of Jamaica's policy on foreign exchange disbursement during the quarter indicate that contractors may now be able to obtain the necessary foreign exchange. A decision was made by the Project Director to change the method of procurement accordingly. This decision introduced delays in the contracts, and may require retendering of bids. One small job, May Pen Health Centre, was completed during the quarter.

## SOLAR HOT WATER APR.-JUN. 1984

	<u>Previous Quarter</u>	<u>This Qrt.</u>	<u>Total Project</u>
Solar installations completed	5	1	14
Solar installations in progress	6	6	6
Expenditure for installations completed (JA\$)	178,000	8,000	675,000

## SOLAR HOT WATER APRIL - JUNE 1984 contd.

Commitments for installations in progress (JA\$)	685,000	174,000	174,000
Savings from completed installations (BOE/yr)	272	13	1,484
Savings from completed installations (JA\$/yr)	41,200	2,500	185,000

As indicated, total savings achieved on the project to date amount to 16,252 BOE per annum for project-funded installations and 8,207 BOE per annum from installations funded by public enterprises (factories and hotels). This spin-off multiplier continues to be noteworthy, as plants are using the results of the energy audits as ground work for making conservation investments.

## 2. Potential savings

Potential savings identified by energy audits includes both operations and maintenance ECOs and retrofit ECO's. In general the project funds only retrofit ECO's expecting the facilities to make the no-cost operations changes and to fund the low-cost, fast payback maintenance ECOs out of existing maintenance budgets. Only one energy audit was completed during the quarter. Most major public sector facilities have now been audited. The result of the audit programme, in terms of potential savings, including solar water heating as a potential retrofit ECO, are summarized below.

## ENERGY AUDIT POTENTIAL APRIL - JUNE, 1984

	<u>Previous Quarter</u>	<u>This Qrt.</u>	<u>Total Project</u>
Energy Audits completed	6	1	52
Total energy used by plants audited (BOE/yr)	34,123	2,028	831,819
Potential savings by audits (%BOE/yr)	37	17	20
Total potential savings (BOE/yr)	12,579	343	163,744
Total potential savings (JA\$/yr)	1,832,000	91,000	16,662,000
O&M potential savings (BOE/yr)	6,207	142	52,255
O&M potential savings (JA\$/yr)	929,000	14,000	4,794,000

## ENERGY AUDIT POTENTIAL APRIL - JUNE, 1984 contd.

Retrofit potential savings (BOE/yr)	6,372	201	111,489
Retrofit potential savings (JA\$/yr)	903,000	77,000	11,868,000

## 3. Other project components

The general status of the other project components are summarized below:

- 1) Energy Division fully staffed with qualified energy planners and technicians - no progress during the quarter: Project Director resigned, no new appointments, restructuring of ED closer to approval;
- 2) Energy Information Center fully equipped and operational - books continue to be received by library, IBM-PC computer upgraded with memory expansion kit purchased in Jamaica, request for proposals from EIC technical assistance released;
- 3) National Energy Accounting System established - no change to existing system;
- 4) National Energy Model prepared - revisions to model data in process, contract extension negotiated with Argonne National Lab. to provide documentation for model, update data, and transfer to Jamaican computer;
- 5) Standards established for solar water heater - building for solar testing laboratory at Bureau of Standards under construction, test equipment not yet selected, standards committee established;
- 6) Meteorological data base - two solar stations operational and recording data, instruments for 10 wind-mapping stations received, technical assistance to help set up wind instrumentation has been provided and stations installed.

## B. Observations and Recommendations by Meta Systems

A number of observations and recommendations were made in the report for last quarter. Some of these issues have still not been addressed. An update on these problem areas is provided below.

1. GOJ Funding - The project continues to be underfunded by GOJ. Also there has been no indication that GOJ or USAID will introduce an alternative to the 40% reimbursement system, in order to increase funds available for the coming year.
2. Project design - There has been movement toward a redesign of the project, including a revision to Annex I of the Project Loan Agreement prepared by Mr. W.L. Boyne. It is still not clear what alternative energy demonstration projects will be funded. Meta Systems has recommended projects such as bagasse drying, solar industrial process steam, and wood gasification.
3. Energy Division staffing - The services of the project director were terminated during the quarter. Mr. Boyne was appointed acting director. There were no new members of technical staff added during the period. Vacancies in directorship and senior posts continue.
4. Energy Division reorganisation - There was some movement toward a reorganisation of the ED during the period, however the reorganisation was not implemented.
5. Energy Generalist - Meta Systems received permission to fill this vacant post. A candidate was interviewed in Jamaica near the end of the quarter.
6. Alternative Energy Specialist - Meta Systems received permission to fill this vacant post. Candidates were identified and interviews are expected next quarter.
7. Biomass (energy from sugar cane) - Meta Systems continues to recommend that a bagasse drying system be installed at a Jamaican sugar factory

During the quarter, a team of consultants selected by USAID/ Washington was in Jamaica conducting a feasibility study of the prospects for electric power generation from sugar factories.

8. Training - A training plan was prepared by the Energy Division during the quarter. Meta Systems observes that USAID has rejected the training plan, mainly on the grounds that it does not address the proposed reorganisation. As a result, USAID has apparently taken a decision to reject any requests for training until a suitably plan is prepared. Meta Systems observes that this is a delicate issue at present in the Energy Division which is in a state of flux (the reorganisation not having been approved), and suggests that USAID reconsider its position. Many training proposals can be assessed on an individual basis and are not impacted by the proposed reorganisation.
9. Energy Information Center - GOJ solicited proposals for the EIC technical assistance during the quarter. Meta Systems observes that although USAID briefed the Project Director on the procedures of host country contracting, the RFP solicitation was poorly handled as neither the Commerce Business Daily, Jamaican Embassy in U.S., nor USAID were used in the solicitation. Instead regular mail was used and time lags of over two months were introduced. The RFP was not reviewed by USAID, and at least three different letters were sent to the prospective bidders to address due dates, scope of work, and project background. At least one of the bidders received only one of the letters. Meta Systems recommends that USAID coordinate future overseas solicitations to ensure that prospective bidders receive adequate information and time to prepare their response.
10. Short term technical assistance - Meta Systems, through its subcontractor Southern Electric International, began work on the transportation fleet energy management technical assistance during the quarter. It is expected that this will be completed next quarter. Approval was also granted for Meta Systems to subcontract to Brace Research Institute for solar crop drying

technical assistance. This should begin next quarter. There are a number of other short term technical assistance needs, as described in last quarter's report. A new potential project involves a study of the feasibility of converting the electric power generation systems of Jamaica Public Service from oil to coal-water mixture fuel. Such a retrofit would reduce fuel cost, but will also require derating of the peak capacity of the units. The study is required in order to estimate the extent of derating and assess the project costs and benefits.

11. Phase II (private sector) Energy Credit Fund - Operation of the ECF began during the quarter. First disbursements of funds may occur next quarter.
12. IBRD team visit - The World Bank energy sector assessment team's report is expected next quarter.
13. Energy pricing - Further significant increases in energy prices were experienced during the quarter. Present prices are as follows:

<u>Energy Form</u>	<u>Unit</u>	<u>Prices</u>				<u>Incr.</u>
		<u>6/83</u>	<u>12/83</u>	<u>3/84</u>	<u>6/84</u>	
gasoline	IG	\$4.65	\$5.99	\$8.99	\$8.99	93%
diesel fuel	IG	2.90	3.99	5.99	5.99	107
Bunker C	IG	1.60	2.60	3.00	3.90	144
kerosene	IG	2.50	2.50	3.00	3.71	48
LPG	lb	0.63	0.63	0.82	1.00	59
elect. (res.)	kWh	0.32	0.32	0.45	0.70	119
elect. (C & I)	kWh	0.27	0.27	0.38	0.50	85

These price increases mainly result from the devaluation of the Jamaican Dollar. Gasoline consumption continues to be reduced since the increase in price. Estimates are that the reduction amounts to about 12-15%. The increase in electric rates may also achieve some energy conservation, but results are not yet available. The recent round of electricity prices increases also did not address the internal flaws, such as the declining block structure in the residential and small commercial rates and also demand charges which are too low in the industrial rates.

## II. META SYSTEMS ACTIVITIES DURING THE QUARTER

### A. Programme Planning and Management

#### 1. Administrative review of Meta Systems contract.

During this reporting period, an administrative review of the Meta Systems contract was made by personnel from Meta Systems head office. Ms. Sandra Robinson, Principal, and Dr. Richard Tabors, Senior Consultant, visited Jamaica for meetings with USAID and GOJ personnel. Topics discussed at these meetings included:

- Post of Energy Generalist
- Post of Alternative Energy Advisor
- Short term technical assistance
- Consultant selection and approval procedures
- Subcontractor selection and approval procedures
- Project progress and problems

These meetings were most helpful in determining the direction and goals of the contract.

#### 2. Energy Generalist

A decision was made by USAID and GOJ to fill the post of Energy Generalist. Meta Systems provided a candidate, Mr. John Armstrong, who was interviewed in Jamaica late in the reporting period. Meta Systems understands that GOJ would like to interview another candidate before making a decision. Meta Systems will supply a suitable candidate for interviews in the next reporting period.

#### 3. Training

The Energy Conservation Advisor served on the ED training committee to revise the training plan developed for the ED. Lectures were given by the Conservation Advisor as follows:

15th May 1984 - General Electric Seminar -  
"Electrical Energy Conservation opportunities in Jamaica"

22nd May, 1984 - Energy Auditors seminar for Energy Credit Fund - "Critique of Energy Auditors Performance"

24th May, 1984 - Bankers seminar for Energy Credit Fund - "Energy Problem in Jamaica"

#### 4. Conferences

In addition to normal duties and internal MME Committees, the following conferences were attended by the Energy Conservation Advisor:

April 12, 1984 - World Bank Energy Assessment presentation  
 April 25, 1984 - General Motors methane from landfill  
 May 10, 1984 - Wind monitoring equipment presentation  
 May 15, 1984 - General Electric seminar - motors and lighting  
 May 16, 1984 - 3M Company - dedication ceremonies  
 May 22, 1984 - ECF Energy Auditors seminar  
 May 24, 1984 - ECF Bankers seminar  
 May 24, 1984 - Aprovecho Wood Stoves presentation  
 May 29, 1984 - Agro 21/USAID Energy Cane Assessment briefing  
 May 30, 1984 - OXCE Fuel coal-water mixture presentation

#### B. Energy Conservation

##### 1. Auditing and Retrofitting

The following facilities were visited by the Energy Conservation Advisor to review energy audits done by Jamaican Contractors and/or to provide advice on potential retrofits or retrofit installation in progress:

- Isaac Barrant Hospital
- Princess Margaret Hospital
- Duckenfield Sugar Factory
- University of the West Indies
- UWI Hospital
- Kingston Public Hospital
- Wyndham New Kingston Hotel

## 2. Energy Credit Fund

The Energy Conservation Advisor was instrumental in the launching of the ECF during the reporting period. He provided feedback to energy auditors on their audit performance and training to help ensure high quality audits under the programme. He also addressed representatives of the ECF's affiliated financial institutions on the technical aspects of energy conservation. The Conservation Advisor accompanied energy auditors on site visits to the following plants, and provided advice on energy conservation opportunities:

- Gleaner Company
- Highgate Foods
- Kingston Ice Making Company

## 3. Private Sector technical assistance

The Energy Conservation Advisor provided assistance to the following private sector companies during the quarter:

- El-Mech Engineers - Highgate Foods energy audit
- Tropical Energy - Kingston Ice energy audit
- Econergy - Gleaner Co. energy audit and retrofit
- Lighting Mfg. - production of hotel room energy management systems
- Goodyear Jamaica - coal conversion and cogeneration
- Reginald Aitken - retrofitting of Land Rover vehicle with diesel engines
- Appliance Traders Ltd.- hotel room energy management systems, high efficiency window air conditioning units.

## 4. Technical assistance

The Energy Conservation Advisor authored or co-authored papers on variety of subjects as technical assistance to the GOJ during the quarter.

Topics addressed included:

- Cogeneration and coal conversion - concept submitted to PCJ;
- Wood energy at paper factory - analysis of proposal submitted to Project Director;
- Conversion of JPS boilers to coal-water mixture fuel - analysis submitted to Minister of Mining and Energy ;
- Energy Conservation incentives - recommendations submitted to Director of Conservation;
- Energy conservation building code - recommendations submitted to Director of Conservation;
- Critique of energy auditor performance - submitted to Conservation Engineer and energy auditors;
- Energy conservation initiatives in the Philippines- analysis submitted to Director of Conservation;
- Electric rates modification for energy conservation - concept submitted to Permanent Secretary, MME;
- High efficiency air conditioners retrofit - concept submitted to Conservation Engineer.

5. Transportation fleet energy audits

The short term technical assistance for energy audits of vehicle fleets<sup>s</sup> was begun during the quarter. Consultants from Southern Electric International as subcontractor to Meta Systems began work in Jamaica on 7th May, 1984. The fleets of Jamaica Public Service and Ministry of Agriculture are being audited by the consultants. When the audits are completed, the SEI team will prepare a fleet energy conservation handbook and energy audit forms. They will then present a training course to Jamaican energy auditors, including a practical audit of the Jamaica Telephone Company. Meta Systems expects this activity to be completed around the end of the next reporting period.

## C. Alternative Energy

### 1. Wind Instrumentation

During the reporting period, Meta Systems provided Mr. Ken Starcher, of the Alternative Energy Institute, to assist the Jamaica Meteorological Office with the installation of wind mapping instrumentation procured under the USAID/GOJ project; Mr. Starcher was in Jamaica from 7-10th May, 1984 during which time he demonstrated the installation techniques, delivered an oral presentation at MME, and prepared a written report.

### 2. Solar crop drying

USAID approved in principle the selection of Brace Research Institute as subcontractor to Meta Systems pending a waiver (because Brace is based in Canada). This waiver had not been finalised as of the end of the reporting period. Meta Systems expects this activity to begin in the next quarter.

### 3. Energy Cane

The Energy Conservation Advisor met with members of the Energy Cane Assessment team during the quarter. The Energy Cane team's report is expected during the next quarter, and the Conservation Advisor has been asked to assist in the engineering/factory analysis.

### 4. Solar water heating

Technical assistance in the design of a solar water heating system for Princess Margaret Hospital and in the design of instrumentation and monitoring systems to determine energy savings resulting from solar installation was provided by the Conservation Advisor during the quarter.

D. SUMMARY OF SHORT-TERM TECHNICAL ASSISTANCE

During the sixth reporting period, the following Meta Systems consultations were in Jamaica providing technical assistance:

Mr. Ken Starcher, May 6-10, 1984 - wind mapping instrumentation;  
Mr. Ken Duval, May 7-11, 1984 - transportation fleet energy audits;  
Mr. Hans Hanson, May 7-11 1984 and May 28-June 1, 1984 - transportation fleet energy audits;  
Mr. Gary Johnson, May 7-11, 1984 and May 28-June 8, 1984 - transportation fleet energy audits.

In addition, the following personnel were in Jamaica on administrative and contract management matters;

Ms. Sandra Robinson, May 2-5, 1984 - administrative review of contract.

Dr. Richard Tabors, May 2-5, 1984 - administrative review of contract;

Mr. John Armstrong, June 25-27, 1984 - interview for post of Energy Generalist.

### III. META SYSTEMS ACTIVITIES PLANNED FOR NEXT REPORTING PERIOD

#### A. Program Planning and Management

1. Energy Generalist - provide additional candidate(s) for interview by GOJ and USAID.
2. Project Management - continue to provide advice on priorities for implementation and day-to-day project management.
3. Training - assist in development of training programme for Energy Division personnel, including introductory energy course for non-technical personnel.

#### B. Energy Conservation

1. Auditing and retrofitting - continue to review audits, inspect facilities on site, recommend retrofits, follow-up retrofits in progress, and monitor completed retrofits.
2. Energy Credit Fund - continue to advise energy auditors and prospective borrowers as requested.
3. Public education - continue to assist in development of energy tips, develop case studies of retrofits, and review energy managers handbook when prepared by Jamaica counterparts.
4. Transportation fleet energy audits - complete fleet audits of JPS and M of A, present audit results, develop handbook, prepare for training course.
5. Post-audits - develop format and procedures for conducting follow-up reviews of retrofits at 6-12 months after completion.

#### C. Alternative Energy

1. Alternative Energy Advisor - provide candidate(s) for interview by GOJ and USAID.
2. Solar crop Drying - begin consultancy to assist CAST and

ED with design and development program.

3. Energy Cane Assessment - assist USAID consultant team with assessment of electric power generation from excess bagasse in sugar factories.
4. Solar water heating - provide technical assistance as required.
5. Solar standards - assist with development of testing laboratory equipment list.