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INTERNATIONAL DEVELOPMENT COOPERATION AGENCY

AGENCY FOR INTERNATIONAL DEVELOPMENT

WASHINGTON, D.C. 20523

PROJECT PAPER  
SUPPLEMENT  
AMENDMENT #3

MOROCCO: Renewable Energy Development -  
Phase II (608-0159)

December 24, 1986

UNCLASSIFIED

RENEWABLE ENERGY DEVELOPMENT - PHASE II

(608-0159)

PROJECT PAPER SUPPLEMENT

NOVEMBER 1986

USAID/MOROCCO

AGENCY FOR INTERNATIONAL DEVELOPMENT  
**PROJECT DATA SHEET**

1. TRANSACTION CODE:  A = Add,  C = Change,  D = Delete  
 Amendment Number: 13  
 DOCUMENT CODE: 3

2. COUNTRY/ENTITY: MOROCCO  
 3. PROJECT NUMBER: 608-0159  
 4. BUREAU/OFFICE: USAID/Rabat  
 5. PROJECT TITLE (maximum 40 characters): Renewable Energy Development, II  
 6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM DD YY 09 30 89  
 7. ESTIMATED DATE OF OBLIGATION (Under "D" below, enter 1, 2, 3, or 4):  
 A. Initial FY 180 B. Quarter 3 C. Final FY 88

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

A. FUNDING SOURCE	FIRST FY 80			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	600		600	9700		9700
(Grant)	( 600 )	( )	( 600 )	( 9700 )	( )	( 9700 )
(Loan)	( )	( )	( )	( )	( )	( )
Other 1.						
U.S. 2.						
Host Country		420	420		5550	5550
Other Donor(s)						
<b>TOTALS</b>	<b>600</b>	<b>420</b>	<b>1020</b>	<b>9700</b>	<b>5550</b>	<b>15250</b>

9. SCHEDULE OF AID FUNDING (\$000)

A. APPRO- PRIATION	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	740	290		600				600	
(2) ARFN	740	290		7048		2052		9100	
(3)									
(4)									
<b>TOTALS</b>				<b>7648</b>		<b>2052</b>		<b>9700</b>	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each):  
 878      850      840

11. SECONDARY PURPOSE CODE: 877

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each):  
 A. Code: TECHN      ENV  
 B. Amount: 3000      500

13. PROJECT PURPOSE (maximum 480 characters)

To help the GOM to create a Center for Renewable Energy Development which has the capability to assess and promote increased reliance on renewable energy in Morocco, including support for the wider participation of the private sector in disseminating economically viable renewable technologies.

14. SCHEDULED EVALUATIONS: Interim MM YY MM YY Final MM YY 1 0 8 8

15. SOURCE/ORIGIN OF GOODS AND SERVICES:  000     941     Local     Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a \_\_\_\_\_ page PP Amendment.)  
 See summary of revised project - P 4 of the PP Amendment.  
 USAID/Morocco Controller approval of proposed method of implementation and financing.

\* Present authorization is \$9,200,000. This action adds \$500,000 to the project and extends the PACD to 30 Sept 89.

17. APPROVED BY: Jamille Ballantyne  
 Title: Mission Director Acting  
 Date Signed: MM DD YY 1 2 2 4 8 6

18. DATE DOCUMENT RECEIVED IN AID/V, OR FOR AID/V DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

RENEWABLE ENERGY DEVELOPMENT - PHASE II

PROJECT PAPER SUPPLEMENT

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ANNEXES

- I. Logical Framework
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USAID PROJECT REVIEW COMMITTEE

James Anderson	Regional Contract Officer
Ulrich Ernest	Economist
John Giusti	Assistant Program Officer
Stephen Klein	E.N.R. Chief
Robert Meighan	Regional Legal Advisor
James Smith	Economist
Randal Thompson	Project Development Officer
Dianne Tsitsos	Project Officer
Samir Zoghby	Project Officer

USAID MISSION REVIEW COMMITTEE

James Anderson	Regional Contract Officer
Janet Ballantyne	Deputy Director
Ulrich Ernst	Economist
John Giusti	Assistant Program Officer
Ernest Hardy	Controller
Charles Johnson	Director
Stephen Klein	E.N.R. Chief
Robert Meighan	Regional Legal Advisor
Kenneth Schofield	Program Officer
James Smith	Economist
Randal Thompson	Project Development Officer
Dianne Tsitsos	Project Officer
Samir Zoghby	Project Officer

ACTION MEMORANDUM FOR THE USAID/MOROCCO DIRECTOR

*Kenneth G. Schofield*

DATE: 12/22/86

FROM: Kenneth G. Schofield, Program Officer

SUBJECT: Authorization of Renewable Energy Development Project (608-0159)

PROBLEM: Approval of the Project Paper Supplement and the Third Amendment to the Project Authorization for the renewable energy development project (608-0159). The grant for Life of Project Funding is \$9,700,000.

DISCUSSION: The Morocco Renewable Energy Development Project (608-0159) was designed to create a Moroccan Center for Renewable Energy Development (CDER) with the professional staff and facilities to carry out a wide range of applied research and pilot activities, studies, and analyses to identify the most effective ways to exploit Morocco's renewable energy potential and develop programs to promote its efficient use throughout the country. Phase I of this project was authorized initially in February 1980 in the amount of \$600,000 to finance preliminary studies, training, and initial equipment procurement. The project was amended in April 1981, and a Project Assistance Completion Date (PACD) of September 30, 1986 was established for Phase II to undertake far more extensive activities. In June 1986, the PACD was extended to March 30, 1987 to complete project activities underway, and to give USAID time to assess whether it should extend the project to September 1989 as requested by the GOM in December 1985. This PP Supplement adds \$500,000 to bring LOP funding to \$9.7 million and extends the PACD to September 30, 1989.

AID has financed two external project evaluations, the first in 1983, and the second in November 1985. The second evaluation recognized the project's success in creating CDER as an institution with legal authority and a staff and established budget, but also raised several concerns for the future, especially the need for a better definition of CDER's goals and activities. USAID financed a reformulation team to recommend directions for the project responding to the findings in the second evaluation report. The team's report was completed in July 1986 and provides the basis, with the second evaluation, for the PP Supplement.

The amended project will concentrate on specific activities within CDER's broader program to demonstrate the techniques of bringing renewable energy technologies to the market, and thus to foster CDER's institutional development by providing an example of successful program implementation.

Activities begun under Phase II of the project include: (1) the construction and equipping of a new CDER building in Marrakech; (2) the completion of pilot projects demonstrating renewable energy technologies, including (a) small decentralized hydroelectric generation, (b) direct use of solar energy, mainly photovoltaic cells for productive use in rural areas, (c) use of wind for electricity generation and water pumping, and (d) biomethanation (bio-gas); (3) training in Morocco and the U.S. for Moroccan professionals assigned to CDER; and (4) the provision of long-term technical assistance and short-term advisory services to support training, management, and research activities. Technical assistance has been provided through a host country contract between CDER and the Research Triangle (RTI).

The major activities to be undertaken during the remaining life of the project include (1) market development of solar water heating, and water pumping; (2) technology assessment of bio-methanation; and (3) limited institutional support activities, which include the establishment of a documentation center, and the completion and equipping of the CDER building. Under an AID-financed contract with an 8(a) firm, three long term advisors, supplemented by short term consultants in selected areas, will provide technical assistance.

Under Section 2 of Redelegation of Authority No. 133.3A you have authority to approve project amendments which (1) do not exceed \$30 million LOP funding; (2) present no significant policy issues; and (3) require no further issuance of waivers by AID/W. This PP Supplement is within these guidelines. However, you have the authority to approve PACD extension NTE 2 years. With this PP Supplement the PACD is being extended for a total of 3 years. Ad Hoc redelegation of authority to approve the project amendment was requested of AID/W by cable (Rabat 11682, dated November 26, 1986) and was granted to you on December 11, 1986 by State 383608

Because of the increase in LOP funding, a Congressional Notification will have to be submitted to Congress. This will be done o/a December 29, 1986. However, CN expiration without objection is not required prior to your authorizing the PP Supplement since the additional LOP funding is not being obligated at this time.

RECOMMENDATION:

- (1) That you sign the attached PP Supplement providing for an extended Phase II of the Renewable Energy Development Project.
- (2) That you sign the attached Project Authorization Amendment No.3 increasing the total LOP funding from \$9,200,000 to \$9,700,000.

Clearance: ENR: <sup>la</sup>SKlein SMC  
CONT: EHardy \_\_\_\_\_  
RCO: JAnderson \_\_\_\_\_  
ADDR: RMeighan Rm

AMENDMENT III  
TO  
PROJECT AUTHORIZATION

Name of Country: Morocco

Name of Project: Renewable Energy  
Development  
Number of Project: 608-0159

1. Pursuant to section 106 of the Foreign Assistance Act of 1961, as amended (FAA), the Renewable Energy Development Project for Morocco was approved by the Assistant Administrator, Bureau for Near East, on February 20, 1980, for total authorization funding of \$600,000. That authorization, pursuant to section 103 of the FAA, was amended on August 13, 1981 by adding \$6,100,000 in grant fund over a five-year period. That authorization, pursuant to section 103 of the FAA, was amended on April 8, 1983 by adding \$2,500,00 in Grant Funds. That authorization, pursuant to section 103 of the FAA, is hereby amended by adding \$500,000 in grant funds over a two-and-half year period from the time of this authorization amendment for total authorized project funding of Nine Million Seven Hundred Thousand United States Dollars (\$9,700,000) subject to the availability of funds in accordance with the A.I.D. OYB/Allotment process, to help in financing foreign exchange costs for the Project.
2. The Project Authorization is further amended by adding the following conditions to disbursement of funds authorized by this amendment:
  - A. Economic analysis capability

Prior to any disbursement of funds or to the issuance of any Document pursuant to which funds may be disbursed under the Project Agreement, the Government of Morocco will, except as the parties may otherwise agree in writing, furnish to AID, in form and substance satisfactory to AID, a plan to strengthen the economic analysis capability of CDER, including hiring of an economist as a counterpart to the technical assistance to be financed by AID.

B. Documentation Center.

Prior to the disbursement of funds or the issuance of any document pursuant to which funds may be disbursed under the Project Agreement, the Government of Morocco will, except as the parties may otherwise agree in writing, furnish to AID, in form and substance satisfactory to AID, a plan to make operational and strengthen the documentation center, including the employment by CDER of a qualified documentalist to be responsible for the center.

Except as hereby amended, the authorization cited above remains in full force and effect.

Signature *Francis Sullentine*

Date 12/24/86

I. SUMMARY AND RECOMMENDATIONS

A. Summary Project Description:

The Morocco Renewable Energy Development Project (608-0159) was designed to create a Moroccan Center for Renewable Energy Development (CDER) with the professional staff and facilities to carry out a wide range of applied research and pilot activities, studies, and analyses to identify the most effective ways to exploit Morocco's renewable energy potential and develop programs to promote its efficient use throughout the country. The project was authorized initially in February, 1980 in the amount of \$600,000 to finance preliminary studies, training, and initial equipment procurement. The project was amended in April, 1981 and a Project Assistance Completion Date (PACD) of September 30, 1986 established to undertake far more extensive activities. In June, 1986, the PACD was extended to March 30, 1987 to complete project activities, and to give USAID time to assess whether it should extend the project to September, 1989 as requested by the GOM in December 1985. This PP supplement will add \$.5 million to bring LOP funding to \$9.7 million.

Activities under the project include: (1) the construction and equipping of a new CDER building in Marrakech; (2) the completion of pilot projects demonstrating renewable energy technologies, including (a) small decentralized hydroelectric generation, (b) direct use of solar energy, mainly photovoltaic cells for productive use in rural areas, (c) use of wind for electricity generation and water pumping, and (d) biomethanation (bio-gas); (3) training in Morocco and the U.S. for Moroccan professionals assigned to CDER; and (4) the provision of long-term technical assistance and short-term advisory services to support training, management, and research activities. Technical assistance has been provided through a host country contract between CDER and the Research Triangle Institute (RTI).

AID has financed two external project evaluations, the first in 1983, and the second in November, 1985. The second evaluation recognized the project's success in creating CDER as an institution with legal authority and a staff and established budget, but also raised several concerns for the future, especially the need for a better definition of CDER's goals and activities.

USAID financed a reformulation team to recommend directions for the project responding to the findings in the second evaluation report. This report -- completed in July 1986 -- provides the basis, in addition to the second evaluation, for this PP Supplement.

The amended project will concentrate on specific activities within CDER'S broader program to demonstrate the techniques of bringing renewable energy technologies to the market, and thus to foster CDER'S institutional development by providing an example of successful program implementation. This approach builds upon -- but is in marked contrast to -- the project's earlier broad-based institutional development effort supported by technical assistance that did not have a clear focus on a discrete set of activities.

The major activities to be undertaken during the remaining life of the project include (1) market development of solar water heating, and water pumping; (2) technology assessment of bio-methanation; and (3) limited institutional support activities, which include the establishment of a documentation center, and the completion and equipping of the CDER building. Under an AID-financed contract with an 8(a) firm, three long term advisors, supplemented by short term consultants in selected areas, will provide technical assistance. USAID will extend the PACD to September 30, 1989. USAID will finance the extended project with funds remaining in the current RTI contract, and funds authorized for the project, but not yet obligated.

B. Recommendation:

That USAID approve this Project Paper Supplement, adding \$.5 million to the current LOP funding level, and extending the LOP from March 30, 1987 until September 30, 1989.

## II. Background and Rationale

The Morocco Renewable Energy Project (608-0159) is designed to assist the Ministry of Energy and Mines (MEM) to create a Center for Renewable Energy Development (CDER) with the professional staff and facilities to carry out a wide range of activities. These activities have included applied research and "pilot" demonstration activities, performance of studies and analysis to identify the most effective ways to exploit Morocco's extensive renewable energy potential, and development of a program to encourage its efficient use throughout the country. Phase I of the project was authorized in February, 1980 and Phase II of the project was authorized in April, 1981, establishing a PACD of September 30, 1986.

AID has obligated \$7,648,000 under the original Project Agreement and Amendments out of the life of project authorization of \$9.2 Million. The FY 1987 budget includes \$1.552 million which the USAID has scheduled for obligation as soon as funds are available.

Research Triangle Institute (RTI) has provided technical assistance for the project through a cost plus fixed fee (CPFF) contract. RTI has provided a two person resident team in Marrakech, including a chief-of-party (under sub-contract with A.T. Kearney) and a technical expert. RTI's organization in the U.S. has provided contract backstopping and short-term consultants.

There have been two external evaluations of the project, the first in 1983, and the second in November, 1985. The more recent evaluation recognized the project's success in creating CDER as an institution with legal authority, and a staff and established budget, but also raised several concerns for the future, especially the need for a better definition of CDER's goals and activities. See Annex II for summary of evaluation findings and recommendations, and USAID/CDER agreement on these recommendations.

In December, 1985, the MEM requested USAID to extend the project for three years to September 30, 1989 because there was inadequate time left in the project to complete all the activities listed in the work plan and RTI contract. In light of numerous project issues raised by the second project

evaluation, USAID informed the MEM that USAID would agree to an interim extension of 6 months to March 30, 1987 to allow time for completion of planned activities. USAID informed the MEM at that time that an extension of the project through September, 1989 would depend on satisfactory MEM/USAID resolution of significant evaluation issues.

USAID and CDER undertook extensive discussions of the evaluation report from December, 1985 through February, 1986. These discussions led to specific USAID/CDER agreement on how each of the evaluation issues would be addressed (see Annex II). In addition, terms of reference were drawn up for a reformulation team financed by USAID which would respond to the central issue of CDER's role, and establish a work plan over an extended project life. The reformulation team visited Morocco in June -July 1986, and completed its report in July 1986.

The reformulation team concluded that CDER recognizes that the initial phase of organizational evolution has reached a conclusion, and that CDER is now entering a second phase with a different orientation. Its role for the future will be the encouragement of the broader use of renewable energy in Morocco by the private sector, and the wider participation of the private sector in providing the means for that use, i.e. manufacture, distribution, and maintenance services. CDER must become a center for information collection and dissemination, policy innovation and recommendation, and market study and development, demonstrating the economic feasibility of these technologies, and playing a catalytic role for the private sector. CDER's future work will be turned away from demonstrations of technical potential towards the commercial diffusion of those uses of renewable energy that have already been developed technically, and are economically competitive.

The reformulation team made the following specific recommendations for reorienting the project and narrowing the AID-assisted project work effort to focus on those technologies that have the most promising economic potential, based on existing data, and on those specific actions that will support GOM and commercial interest in their dissemination:

- (1) Market-Development programs: The reformulation team recommended that

the project support solar water heating and multi-blade windmill pumping because, in financial terms, they represent sound investments. At current fuel prices in Morocco, solar water heaters for residential housing and windmills for low-head, low-output pumping in coastal areas show a positive rate of return in discounted cash-flow analyses, compared to diesel pumping systems and electricity or butagas-based alternatives. Photo-voltaic systems for water pumping and vaccine refrigeration were also selected for market development, because these were thought to be the most cost-effective means of providing potable water, and essential medications to support basic rural health services for remote, wind-poor locations.

(2) Technology Assessments: The reformulation team recommended that CDER assess the potential of biomethanation, solar crop drying, and windmill electricity generation in Morocco. While the economic potential of these systems is not clear, their potential is sufficient to warrant further investigation to establish the costs and benefits involved in their development in Morocco, and the resource base available for this development.

(3) Institutional Development: The report recommended the establishment of a documentation center, completion and equipment procurement for the CDER building, and the establishment and strengthening of institutional linkages between CDER and public and private bodies to support and encourage renewable-energy equipment production and use.

(4) Technical Assistance: The reformulation team recommended that three long-term technical advisors be hired: an advisor/coordinator to provide liaison with CDER Director and Secretary General on overall policy and day-to-day management problems; a technical advisor to work with and assist CDER technical staff on specific technical problems; and an economic/commercial advisor to insure that economic and social issues are included in CDER's examinations and use of renewable-energy technologies in Morocco. Short term technical assistance would include experts in the various renewable energy areas which CDER would explore.

(5) Training: The team recommended that CDER continue English language training for its staff and begin to emphasize analytical training overseas to

develop analytical skills for evaluating technology viability and market potential. CDER's staff should learn the basics of cost/benefit analysis, project appraisal, and market research. Study tours to third countries would be useful in cases where renewable-energy technology industries could be examined.

(6) Linkages with other institutions and donor programs: The team recommended that CDER build up linkages with government institutions and other donor projects and the private sector.

During the period when the USAID was considering the undertaking of the reformulation team work, it extended the PACD to March 30, 1987, and approved a non-competitive extension of the RTI contract to that date primarily to cover the longer time period, with an increased contract amount to \$6,280,782. The RTI work plan negotiated in March and April 1986 reflects CDER/USAID agreements on the revised project directions. Further changes in the RTI work plan may be required to incorporate the most recent discussions and agreements on project details.

The reformulation team's report, as well as the second evaluation report, provide the basis for this PP Supplement, although USAID did not accept all of the recommendations. In September, 1986, the USAID project officer spent a week at CDER interviewing staff and determining what activities they engage in. He concluded that it was not feasible to undertake all of the activities recommended by the reformulation team. The principal reason for this conclusion is that CDER conducts a large number of other activities in collaboration with national and international entities which, taken together with the activities recommended by the reformulation team, overstretch its financial resources and staff. As a consequence, project activities during the project extension will be concentrated on a set of discrete activities to build up CDER's capability to undertake similar activities in the future.

USAID, CDER, and MEM officials have discussed the report's recommendations and have now reached agreement on the amended project presented herein.

### III. DETAILED PROJECT DESCRIPTION

The amended project defines the AID-funded activities through the extended life of the project. The sections below discuss elements of the logical framework (see attached Annex I for logical framework).

A. Project Goal - The project goal remains the same, namely to reduce Morocco's dependence on imported fuels by making maximum use of renewable energy resources while at the same time improving environmental conditions.

B. Project Purpose - The revised project purpose is to help the GOM create a Center for Renewable Energy Development which has the capability to assess and promote increased reliance on renewable energy in Morocco, including support for the wider participation of the private sector in disseminating economically viable renewable energy technologies.

Achieving this project purpose requires the strengthening of CDER's institutional capabilities in the following areas: (a) the assessment of the technical suitability and economic feasibility of alternative renewable energy technologies; (b) analysis of barriers to adoption by end users, and increased domestic production by private sector manufacturers; and (c) design and implementation of actions to overcome these barriers.

CDER has made some progress in acquiring these capabilities during the project implementation to date, but as pointed out in the second evaluation and the reformulation team reports, CDER needs to be more specific in identifying its role and the set of activities it undertakes.

As a result, the amended project will concentrate on specific activities (described in the following section) within CDER's broader program to demonstrate the techniques of bringing renewable energy technologies to the market, and thus to foster CDER's institutional development by providing an example of successful program implementation. This approach builds upon -- but is in marked contrast to -- the project's earlier broad-based

institutional development effort supported by technical assistance that did not have a clear focus on a discrete set of activities. Within the context of the AID-financed focused effort, activities will include:

- o Actions consistent with CDER's new mandate, such as hardware testing and certification, standard setting, general promotion, preparation and dissemination of relevant information, and demonstrations and other support for private sector initiatives;

- o Recommendations to other government bodies, such as proposals for tax treatment, financial arrangements, import policies, necessary for faster adoption, increased manufacture, and improved maintenance of renewable energy technologies in Morocco.

C. Project Activities and Outputs:

The amended project will concentrate on three major activity areas:

- o Market Development
- o Technology Assessment
- o Institutional Support

1. Market Development:

The market development program will concentrate on two types of activities with practical near term applications; solar water heating, and water pumping. (Market development as used herein stresses adoption by the end-user, but also includes promotion of local industry.) By undertaking these activities, CDER will build up its ability to implement market development programs in the future.

1.1. Solar water heating (SWH)

CDER efforts will be directed to establishing a market for solar hot water

heaters and the creation of an industry in Morocco. This choice is based on existing analysis, and experience in other countries that solar water heating in Morocco is economically viable. The program will concentrate on the residential market which now relies primarily on imported petroleum for heating water either by electricity or directly with gas. Details of the Solar Water Heating Program are being defined by a market study to determine the industry's potential, presently being carried out by RTI under its existing contract. Results of the study and recommendations for further development of the solar water heating program will be available early in 1987.

The market study consists of the following components:

The current status of the water heating industry in Morocco -

The study is establishing an inventory of SWH suppliers in Morocco based on a survey of existing installations, a description of the existing hot water heating industry (including equipment, cost, estimate of size of market, performance data)

The demand for water heating equipment - This component will include: a household survey to gather information about the prevalence and use of water heating in Morocco (rate of use, household income, estimate of existing expenditure, funding for purchase, recurrent costs and maintenance); an assessment of the current and future housing stock for apartments, detached houses, and traditional Moroccan housing in the medinas; and a comparable look at the commercial/institutional demand of hotels, commercial buildings, and hospitals.

A technical analysis of design alternatives - This component focuses on the match between various market segments, and climatological data, demand characteristics, and manufacturing capability. Components include: the sizing of solar hot water heaters; design of systems for different market sectors; target costs of designs for various market sectors; and production issues for manufacturing.

Market potential - The study, based on the survey and use of secondary data, will provide an estimate of potential demand covering total number of units, and range of acceptable costs per unit.

Macroeconomic analysis - This component analyzes the returns to the Moroccan economy from net fuel savings, net foreign exchange savings, net impact on utility power generation, and employment generation.

Financial analysis - This component analyzes costs, benefits, and rates of return compared to existing systems and new markets, based on assumptions about production cost and discount rates, and then provides a financial analysis for production; reviewing investment costs, payback, IRR, and financing possibilities.

Conclusions and recommendations - The study will set forth the importance of the Solar Water Heating Program in Morocco, and detail a program of action covering demonstration projects, support for local manufacturers, financing incentives and possible packages for buyers and manufacturers, and policy recommendations. Options for program implementation will be presented.

Based on the results of this study, the solar hot water (SWH) heating program is expected to include the following aspects:

1.1.1 Promoting the Adopting of Solar Water Heating Technology

Water Heating equipment, especially for residential use, falls into the category of durable (consumer) goods. For such purchases, the "objective" advantages in financial and economic terms may not be sufficient to spur widespread adoption, especially if there are gaps in information or policy disincentives. To develop a market for a particular end-use technology, a certain amount of experience (as well as product development), both

well-documented and widely publicized, is essential. In solar water heating, CDER should play a catalytic role in developing and publicizing such information, to help the private sector test products not only in the laboratory but in "real-life" applications to assure that they respond to market needs, and that technical problems have been surmounted. A demonstration program under the project to accomplish these ends will focus on the residential market, but may include commercial applications.

The demonstration program will subsidize -- partially or totally -- the purchase and installation of solar water heating equipment in selected households and commercial installations in urban areas, in exchange for access to the equipment for monitoring and special maintenance. CDER's role will be that of a catalyst; managing, financing, monitoring, evaluating, and disseminating findings. The project team will have no operating responsibilities in installation or maintenance of the equipment. It will work with both local authorities, especially the regies, and the private sector in implementing the demonstration program. While the exact structure of this program will reflect the findings of the SWH market study underway, some elements can already be sketched.

Residential use: The project team will select demonstration households (according to criteria identified in the SWH market study) in three Moroccan cities, Marrakech, Casablanca, and one other. Marrakech will be the first city, given its high levels of insolation and its role as CDER's geographic home. The installations will be clustered in selected neighborhoods to overcome local resistance to a one-of-a-kind syndrome, to test routine maintenance under field conditions, and to assure a valid sample of consumer attitudes and reactions to technical characteristics and alternative financing arrangements. While final decisions will await the completion of the SWH study, we expect approximately 200 households to participate in the demonstration program.

Commercial Applications The commercial applications component of the program is planned at a lower scale, reflecting the need to concentrate on the residential market, and the belief that at this

time commercial applications offer significantly less potential for widespread penetration than residential use. The commercial applications component will be implemented primarily through use of the Small Projects Fund mechanism with CDER. While actively involved in a monitoring and evaluation phase, CDER will not be involved in the details of procurement, installation, and implementation follow-up.

### 1.1.2 Support for Local Manufacture

A key element of the SWH program is to support the efforts of local manufacturers. The demonstration program -- by financing the purchase of private products -- will stimulate the process of product development by firms in or expanding into the solar water heater business. Part of the demonstration program must also be to help overcome the broader policy constraints to market development as identified in the market study. Other steps are also planned. CDER will make continued use of the Small Projects Fund to work with interested parties on a cost sharing basis to implement selected activities. In addition, CDER, with the help of TA, will work with selected local manufacturers on system design, production techniques, and choice of materials; provide an information exchange on US and third-country design developments; train local architects, contractors, and plumbers on potential and maintenance requirements for SWH systems; and provide technical feedback on system performance using CDER's test bench capability.

### 1.1.3. Policy Recommendations

There are a set of public policy recommendations that provide an environment and incentives for a flourishing local industry. These include:

Financing incentives that the GOM could adopt, involving the elimination of existing disincentives. Recommendations in this area would focus on tax and import policies.

Building code issues - Establishment of a SWH industry may require a revision of codes affecting local manufacture, as well as a much closer working relationship with the construction industry and the public utilities.

Public Information Campaign - Working together with local industry groups, CDER needs to build a constituency of supporters for SWH. The program should be carefully structured and targeted, and not initiated, until results from the demonstration program are satisfactory.

Performance Standards for Equipment Selection and Use - CDER has a public policy role to develop performance standards for equipment selection (and government procurement) for SWH. Whether these are mandatory or advisory, CDER needs to use its analytical capabilities and technical resources (the test bench provides CDER with a unique capability in Morocco) to provide some quality control for the new industry, as it begins to make inroads in the public mind.

The outputs for the SWH program are expected to be:

- o Solar water-heating installations in three urban areas;
- o Periodic reports on system performance at these installations;
- o Individual system-performance reports for all locally produced systems and major foreign-made units being marketed in Morocco;
- o Publication of national performance standards;
- o At least one solar water-heating test installation for commercial use in Marrakech;
- o Periodic reports on system performance in these installations;

- c At least one local company actively involved in manufacture and service of solar water-heating systems.

## 1.2 Water Pumping Program

CDER has identified the potential for windmill and photovoltaic pumping under the project, including an assessment of the wind resources, and has developed a program to work with the private sector in the production and maintenance of multi-blade windmills.

RTI has been preparing a detailed pumping study under its existing contract, which provides the rationale and helps to shape the details of the program CDER will be implementing during the project. The study has reviewed existing data for diesel vs. windmill and photovoltaic pumps and is expected to indicate those areas in Morocco where wind or solar powered pumps are the economic alternative. RTI has completed an initial draft of this study, and the final draft is expected by the end of FY 1986. In addition, CDER has been implementing with other organizations a windmill program (PREM) that AID financing will support.

### 1.2.1 Wind Pumping (PREM)

The windmill program will be concentrated in three provinces, Agair, Essaouira, and Marrakech, with strong wind regimes and matching end-use applications. This program intends to help put into use a now much less expensive but effective windmill developed by Dutch wind experts (CWD). In developing the new design from years of applied research in Sri Lanka, India, and Latin America, CWD has succeeded in applying modern techniques in design and production to the windmill industry. With USAID financing, CDER has already sent one of its windmill experts to Holland for training with CWD in the new machine. Under the program, CDER is working with a local manufacturer for production of the CWD design in Morocco.

The program is expected to be carried out in collaboration with the Ministry of Interior, Provincial Governments, UNICEF, CRS, and the Peace Corps. A separate component of the program will address maintenance issues, particularly the rehabilitation of numerous existing windmills.

Based on the work already in place and the results of the RTI pumping study, the wind pumping program is expected to include the following:

1.2.1.1 Installation and Maintenance

This facet of the program will cover the installation of operating systems. While comparable to the demonstration program for solar water heaters in assuring a testing and information feedback, this program includes an operational dimension (although CDER would not be expected to install or even supervise installation of the equipment). CDER has already over the last several years developed the program to the point where it is ready for broader use. Components include:

Formalize collaboration with the Interior Ministry, provincial Governments, and UNICEF. Morocco has a on-going, if still fledgling, program to expand wind pumping in rural areas. This collaboration is important because CDER's role is viewed as providing equipment, monitoring, and evaluation. Similar collaboration is planned with the Peace Corps water pumping program and Catholic Relief Services (CRS) program which are co-ordinated with the same agencies. These agencies possess the capabilities to work at the local level on installation, but lack the financial resources to cover fully purchase of the hardware.

Provide financing for additional windmills and spare-parts. As appropriate sites are identified and the wells are ready, CDER will finance procurement of greater numbers within the context of the existing programs.

Expand the present Agadir program to Essaouira and Marrakech provinces. The wind regimes in Essaouira and Marrakech indicate substantial additional sites are feasible for an expanded PREM program. An expanded program concentrated in specific regions will also enhance the market and financial viability for manufacturers and maintenance firms.

Provide necessary technical support for installation, operation, and maintenance, including establishment of maintenance systems in the provinces. The program anticipates that private firms will be responsible for maintenance. Technical support also will cover establishment and maintenance of a monitoring and evaluation system to track actual performance.

#### 1.2.1.2 Support for Local Manufacture

The RTI assistance to CDER has already identified an appropriate new technology -- the CWD Windmill -- which is now the subject of technology transfer to the Moroccan private sector. The AID supported pumping program will continue this work, including:

Assistance in new designs - The CWD model is an important innovation; CWD technical assistance in Morocco through the CDER linkage will add new information to private firms.

Assistance with existing designs - The program will provide help with the improvement of existing designs to support those companies involved in the traditional wind pumping business.

Assistance to Moroccan associations - CDER has been an active force in supporting the establishment of private associations to share information, hold seminars and promote appropriate use of the technology. AID will support CDER in this effort.

#### 1.2.1.3 Develop information and communication systems

CDER's analytic and catalytic role can facilitate use of Morocco's indigenous wind resource. Specific actions include:

Documentation center - The data base to be developed and maintained in the Documentation Center will provide an important feedback on domestic installations and performance.

Collect information on international developments - CDER will collect information on new developments in the wind business in other parts of the world, especially important as results from numerous wind programs in the third world are now becoming available. Similarly, CDER will participate in international networks now being formed to share experiences, and identify the most effective program options.

Publish reports and promotional materials - CDER will prepare reports and materials addressing system performance, promotional materials explaining those applications where windmills are viable, information (manual) on windmill maintenance and repair, and progress reports on the PREM program.

#### 1.2.1.4. Policy Recommendations

As in other areas, a set of policy recommendations will be prepared by CDER based on work with the private sector, and associations covering financial incentives and disincentives, customs policy, public information campaigns and performance standards.

The PREM program outputs are expected to be:

- o Windmill rehabilitation and expanded use of windmill pumping in three provinces;
- o At least three local producers involved in active manufacture of windmills;
- o Local production of new CWD windmill design;
- o Creation of data base on Morocco windmill water-pumping activity and performance;
- o Periodic reports on PREM progress;
- o Publication of promotional and instructional materials.

### 1.2.2. Rural Village Water

As part of the pumping program, USAID will help the GOM respond to the needs of many of Morocco's villages remote from the electric grid and reliable access to diesel fuel to provide energy, especially for potable water. Meeting these needs is a priority for the Moroccan Government, as reiterated by the Minister of Energy in a July Briefing with the reformulation team, and subsequently in a meeting with USAID officials in October. The GOM, through assistance from UNICEF, CRS, ONEP and the Peace Corps, has developed a variety of programs to supply water. Care must be taken to match the technology with both the renewable energy resources and the end-use requirements to assure that the application of the proposed technology is appropriate (rather than a technology fix). Windmills (under the PREM program above) or photovoltaic powered pumps are well established cost-effective technologies where conditions are right (eg. insolation, wind regime, water depth, output required), and the GOM has already installed some systems. With financing under the project, CDER will provide both the technical expertise to assure an effective matching, and the establishment of a monitoring and evaluation system to produce performance results.

A major rationale for the pumping study is to identify conditions where applications of renewable energy technology can economically meet the needs of remote locations. The CDER analysis also will cover the mix of solar insolation or wind regimes, with water tables and water requirements to assure provision of village water.

The village water pumping program is expected to include collaboration with the GOM's embryonic program to supply village water in remote locations involving the Interior Ministry, UNICEF, CRS, and the Peace Corps. Components include:

Funds for Equipment Purchase - CDER will finance purchase of renewable energy technology (PV pumps or windmills) where the technology is appropriate and local arrangements have been made for well construction, and system installation and repair. As in other aspects of AID supported activities, CDER will not install or maintain the systems with its own staff.

Technical Support - CDER will provide advice on site selection, using the base of information it has already developed, and establish and maintain a monitoring and evaluation system. The monitoring and evaluation system will include comparison of actual field results with controlled laboratory results from the AID-financed testing and training facility at the School of Mines.

The program outputs from the village water pumping program will be:

- o Publication of comparative analysis of pumping systems, identifying geographical areas where photovoltaic pumping is economically viable;
- o Installation of photovoltaic pumping systems in remote locations (about 20 installations are contemplated);
- o Periodic reports on photovoltaic-system field performance;
- o Publication of detailed technical analysis of photovoltaic system performance at the School of Mines.

2. Technology Assessment:

This effort is designed to fulfill CDER's role to provide basic economic and technical information on potential renewable energy technologies which will justify further market development efforts for the technologies. The effort involves extensive data gathering and analysis on the part of CDER. These technology assessments are ideally suited to help CDER cement its collaborative relationships with other agencies. It can accomplish this by (i) delegating responsibility for data gathering and analysis to other organizations, and (ii) providing financial support for the activity. Only one technology assessment will be undertaken during the project extension, that of bio-methanation.

## 2.1 Bio-Methanation (Bio-Gas)

For several years, CDER has placed significant emphasis on bio-gas programs. However, a study by Dr. Norman Brown, completed in March 1986, recommended deferral of any CDER supported market development program until CDER had conducted an assessment of both the end-uses and the resource base. A technology assessment to be carried out by CDER staff with INAV, ORMVA, the Peace Corps and academic institutions will provide this information. In the interim, CDER technical activities in this area will address information requirements needed to assess the application of the technology.

Programs outputs are expected to be:

- o Periodic reports on technical and economic performance of existing installations;
- o Publication of feasibility analysis for single-family farm digesters, and justification for choice of design;
- o Publication of feasibility analysis for digester installation in larger agricultural systems (cooperatives, agro-industrial operations).

## 3. Institutional Support:

The project is designed to build CDER as an effective institution, and thus the direct institutional support aspects of the project continue to be important (within the context of AID focus on specific program activities described above). The key areas of institutional support will include:

### 3.1 Documentation Center

CDER will establish its documentation center as an important concept of its catalytic role. It will become a valuable resource for private and public sector organizations when its data base provides information on

state-of-the-art developments in the priority technologies and has up-to-date records of project activities and participants involved in the use of renewable energy systems in Morocco. In addition, CDER's capability to provide useful information will strengthen its linkages with Moroccan institutions in the private sector when it needs reliable information on which to make investment decisions and in the public sector for background and recommendations for policy decisions.

### 3.2 CDER Building

The construction of CDER headquarter's building is a major GOM contribution to the project, and work is moving ahead. Construction is estimated for completion in March 1988. The building will incorporate renewable energy technologies as a demonstration of their potential. This will include passive cooling techniques in the design as well as a highly visible use of solar hot water-heating system, not only for the residential housing in the complex but also for the main building. RTI has provided a Solar Energy Research Institute (SERI) expert who has prepared detailed models and recommendations for the architect. Installation of solar water heating systems will provide an ideal opportunity for CDER to stimulate commercial activity in the manufacture of these systems in Morocco, possibly including a national contest for local design, fabrication, and installation with CDER providing a subsidy and the necessary monitoring and evaluation.

Specialized equipment for the new CDER building will be financed under the project. Several equipment lists have been prepared since the original project authorization, reflecting both different technical perspectives and the changing CDER role. The refinement of CDER's role as a catalyst and promoter -- rather than a major research institution -- as outlined in this PP Supplement will require additional revisions to this list, because some of the equipment assumed a research function which is no longer essential. The reformulation team's recommendation was to employ technical experts to establish the essential equipment list in disciplines related to the renewable energy technologies which CDER and AID agree are the areas of concentration under the project. If possible, RTI will be requested to do this under its existing contract so that advance ordering of the basic equipment can be accomplished. Otherwise this work will be carried out under the subsequent technical assistance contract.

Outputs of the institutional support are expected to be:

- o Documentation center established and operational.
- o CDER building complex completed and equipped.
- o Improved program/project management systems.

D. Project Inputs - USAID inputs to accomplish the project outputs, purpose and goal are listed below. USAID will finance the amended project from the reprogramming of funds previously obligated and earmarked but not yet expended, and the obligation of a further \$2,052,000 ( \$1,552,000 originally authorized but not yet obligated plus an additional \$500,000 in LOP funding).

(1) Technical Assistance: \$1,275,000

Three advisors financed under a contract with an 8(a) firm will provide residential technical assistance; an economist/financial analyst; a technical specialist; and a marketing expert. These advisors will be responsible for supporting the implementation of the USAID-financed CDER programs as outlined herein, including provision of guidance in economics, marketing, technical details, marketing; and monitoring of achievement of program goals. Within the context of the specific activities USAID and CDER have agreed to implement, the technical assistance team will support the "encadrement" (team building and guidance) of the CDER project team selected from among the employees of CDER, with special attention to development of well-defined analytical and management skills among team members. Two major tasks fall to the residential technical assistance team: (i) to help the CDER project team maintain the momentum to achieve project objectives (mobilizing information or needed technical skills, establishing with team members specific benchmarks within the program, reviewing schedules for achievement or non-achievement of targets); and (ii) to become familiar with conducting or, more importantly, using technical and economic or financial analysis to find ways to promote adoption, manufacture and maintenance of renewable energy technologies in Morocco.

One expert should possess strong skills in the practical application of economic and financial analysis to help strengthen CDER's capability to assess in general the application of renewable energy technologies in Morocco, and to support in particular the CDER activities USAID is financing under the project. The second expert will provide technical guidance in the implementation of the solar hot water heating and water pumping programs, as supplemented by specialized short term technical assistance to complement his/her skills. The third expert will possess extensive marketing skills and a practical business orientation to help strengthen CDER's ability to work with the private sector.

The technical assistance team should have broad-based practical experience and relevant training that will merit the respect and trust of the CDER staff, and the private sector firms with which the activities will be implemented. The chief of party should have proven ability to obtain and use information on all facets of the types of problems the CDER project is addressing, related to economic, financial, technical, and marketing questions or overall policy problems. While USAID assumes the chief of party will be the economist /financial expert, the final selection will depend on the team proposed and the team's particular mix of relevant experience and background.

Short term technical assistance in pertinent aspects of renewable energy technology -- as identified by the resident advisors and CDER -- will supplement the technical, economic, and marketing capabilities and experience of the resident team. In addition, USAID will finance a three-month Host Country Contract with the present RII Chief-of-Party. The contract will provide technical and programmatic support to CDER, in particular in the implementation of the results of the solar water heating study.

(2) Training and Seminars:

\$100,000

The training and seminars planned for the remainder of the project will follow the recommendations of the project reformulation team. English language training will be provided to CDER staff. Short term training will concentrate on courses to develop analytical skills for evaluating technology

viability and market potential. Study tours to learn more about renewable energy technology industries will be funded. Examples could include solar water-heating industries in Tunisia, Jordan, and Cyprus; windmill-pumper companies in Kenya, Sri Lanka, and Senegal; and photovoltaic-product distributors in Kenya. Such tours will focus on designs and production techniques and on the interaction between government energy organizations and the private sector, and on specific government policy measures instituted to provide incentives for market development.

CDER has made some limited progress in developing its capacity to assess the economic viability of renewable energy technologies. It hired a young economist some time ago, and has just hired a second senior economist. These economists will carry out cost/benefit analysis and project appraisals, work with technicians in costing and applications of technology and improving cost-effectiveness of designs, and relate these project-level analyses to the larger policy framework of the GOM and the country to ensure their continuing professional development. They will receive training to upgrade their use of cost/benefit techniques: on-the-job in working with short-term economists for assessments of technology and for the formulation of policy recommendations; and in the classroom to learn advances in applying these analyses to renewable energy projects.

CDER's management will receive shorter versions of the basics of cost/benefit analysis, project appraisal and market research to improve their understanding of the techniques being applied, and to enhance their understanding of the possibilities these techniques offer to improving CDER's competitive position as a contributor to energy policy formulation.

CDER and its advisors will determine which staff members are sent for training, and the specific dates and duration of their missions. As a rule, longer-serving staff will receive the first training opportunities, with new recruits expected to serve at least six months in Morocco, before being considered for overseas courses. In addition, CDER members will need to attend short courses to develop new analytical skills and knowledge regarding CDER's market development task.

Short-term technical assistance to CDER will provide training opportunities (seminars, workshops) for local manufacturers, distributors, and users of the systems slated for market development. The value of such training will depend upon CDER's ability to identify those government organizations, private companies, and other groups that can contribute to the dissemination of these technologies, and to attract their interest and involvement in such training efforts:

(3) Renewable Energy Related Project Activities:

- Market Development \$700,000

AID funds will be used to support the Solar Heater Water Heating and Water Pumping programs. AID will finance procurement of equipment, materials, and services in support of these programs. Funds now earmarked under the budget line items for the Small Projects Fund for future wind and solar projects will support the program. In each of these areas, program details will be available prior to earmarking of AID funds. Equipment and material for the solar water heating program are estimated to cost approximately \$200,000 and for the pumping program are estimated to cost approximately \$136,000. Small Project Fund financing for the solar water heating program will cost about \$100,000 and for the pumping program, \$64,000. Costs of placing energy in remote village sites will total \$100,000.

- Technology Assessment \$50,000

This input will cover research plus studies related to the assessment program suggested by CDER for bio-methanation work.

(4) Equipment: \$490,000

USAID has earmarked \$920,000 under the RTI contract for equipment for the CDER building. CDER and RTI have been

drawing on these funds to procure immediate equipment needs to support RTI's work and to equip the laboratory at the Ecole National Supérieure until the PACD. Approximately \$490,000 remains available for purchase of new equipment for the CDER building, especially for the planned laboratories which were an important focal point for the original equipment list. The list of the equipment to be procured will be reviewed by short term technical advisors. The final list should reflect the revised project purpose for the project to emphasize CDER's role as a catalyst for the dissemination of renewable energy technologies with a focus on the two programs to be funded by AID, namely Solar Water Heating and Water Pumping.

(5) Documentation Center: \$200,000

Inputs to the Documentation Center include supplies, office equipment and furniture, publications, data searches, personal computers, and training.

(6) Evaluation: \$50,000

One project evaluation will be conducted in October, 1988, by an outside evaluation team composed of a renewable energy technical specialist and an economic or marketing specialist.

IV. PROJECT ANALYSIS

A. Financial Plan and Analysis

<u>Item</u>	<u>AID</u>	<u>GOM</u>	<u>Total</u>
<u>Market Development</u>	\$700,000	\$350,000	\$1,050,000
Solar Water Heating	(\$400,000)	(\$200,000)	(\$600,000)
Windmill and Photovoltaic Pumping	(\$300,000)	(\$150,000)	(\$450,000)
<u>Technology Assessment</u>	\$50,000	\$ 50,000	\$100,000
<u>Technical Assistance</u>	\$1,275,000		\$1,275,000
<u>Equipment</u>	\$490,000		\$490,000
<u>Training and Seminars</u>	\$100,000	\$ 75,000	\$175,000
<u>Documentation Center</u>	\$200,000		\$200,000
<u>Evaluation</u>	\$ 50,000		\$ 50,000
<u>Contingences</u>	<u>\$245,000</u>		<u>\$245,000</u>
<b>Total</b>	<b>\$3,110,000</b>	<b>\$475,000</b>	<b>\$3,585,000</b>

The above financial plan covers project activities for the period of April 1, 1987 through September 30, 1989. Funding for the remainder of the project will come from funds remaining in the RTI contract, which expires on March 30, 1987 and funds remaining in the project outside the RTI contract. An analysis of funds remaining as of March 30, 1987 is shown on the next page. The subsequent page shows the changes in LOP funding since the authorization of the Phase II project.

Funds already budgeted for the Small Projects Fund (\$107,000) will be utilized for the program, and part of the additional financing to support the market development program will be financed through additional inputs to the Small Projects Fund.

608-0159

ANALYSIS OF FUNDING AVAILABILITY (20 Oct. 1986)  
(obligations in \$000)

Category	Funds obligated to Date	Project expenditures as of 9/30/86	Project expenditures to 3/31/87	Balance available \$
1. Prep. Studies and Workshops	714,000	713,946	- 0 -	54
2. Priority Equipment	83,000	80,688	- 0 -	2,312
3. Technical Assistance	4,594,300	3,822,819	771,481	- 0 -
4. Lab Materials	920,000	379,294	50,000	490,706
5. Training	258,700	- 0 -	50,000	208,700
6. Small Hydro Pilot Projects	350,000	- 0 -	50,000	300,000
7. Solar and Wind Pilot Projects	400,000	313,596	86,404	- 0 -
8. Biomass Pilot Projects	22,000	1,836	- 0 -	20,161
9. Future Solar and wind Projects	- 0 -	- 0 -	- 0 -	- 0 -
10. Future Biomass Projects	- 0 -	- 0 -	- 0 -	- 0 -
11. Small Projects Fund	107,000	- 0 -	107,000	- 0 -
12. Evaluation	78,000	72,857	- 0 -	5,135
13. Training (AID)	71,000	70,566	- 0 -	434
14. Contingencies	50,000	9,888	10,000	39,012
<b>TOTAL</b>	<b>7,648,000*</b>			<b>1,066,512</b>
Additional obligations				<u>2,052,000</u>
Total funds available				<u>3,118,512</u>

\* Includes \$29,000 of funds obligated outside of this project agreement

RENEWABLE ENERGY DEVELOPMENT  
LOP FUNDING ANALYSIS  
(\$000)

Category	1st ProAg Amdt 26 Aug 81 (Phse II Prjt)	Fifth ProAg Amdt 27 July 84	Sixth ProAg Amdt 24 June 86	PP Supplement Nov. 1986
1. Prep. Studies and Workshops	465	763	714	714
2. Priority Equipment	-	106	83	81
3. Technical Assistance	1875	3995	4594.3	5869.3
4. Lab Materials	1195	1544	1427.8	1120 <sup>1/</sup>
5. Training	1255	415	258.7	150
6. Small Hydro Pilot Projects	580	1100	350	50
7. Solar and Wind Pilot Projects	260	370	400	400
8. Biomass Pilot Projects	20	22	22	20
9. Future Solar and wind Projects	300	228	98	520 <sup>2/</sup>
10. Future Biomass Projects	330	207	62	50 <sup>3/</sup>
11. Small Projects Fund	320	345	345	287 <sup>4/</sup>
12. Evaluation	50	30	128	123
13. Training (AID)	-	71	71	71
14. Contingencies	-	-	646.2	244.7
TOTAL AID	6700	9200	9200	9700
GOM CONT	5550	5550	5550	5550

<sup>1/</sup> Includes \$200,000 for Documentation Center

<sup>2/</sup> Allocation for market development (\$700,000) less \$150,000 reserved for small project fund activities.

<sup>3/</sup> Technology Assessment

<sup>4/</sup> Includes \$107,000 remaining from funds previously earmarked for this line plus an additional \$100,000.

### Economic and Financial Considerations

There are several economic and financial considerations of relevance to this project. These are summarized below:

- o Careful attention must be given to the economic and financial aspects of renewable energy. An Inspector General Report to the Congress (Oct 85 - March 86) discussing AID renewable energy projects criticized the agency for paying insufficient attention to commercial viability as a key aspect of replicability. Technologies financed were thought to be too complex, too expensive or not suited to the needs of users. The November 1985 Evaluation Report of this project made the same criticism, and recommended that CDER, in addition to defining its role, concentrate its attention on solar hot water heating, windmill pumping, and bio-methanation for its future work.

The reformulation team report concurred with the emphasis on solar water heating and windmill pumping as commercially viable technologies, but recommended that bio-methanation activities should remain in the technology assessment stage until there was clearer evidence that bio-gas in Morocco was ready for dissemination.

Solar hot water heating for residential use and multi-blade windmill pumping systems represent sound investments in Morocco. At present fuel prices, these systems for specific applications and compared with specific alternatives (hot water heating with butane, or electricity, and low-head low output utilization in good wind regimes) show a positive rate of return in discounted cash-flow analysis.

One of the most controversial and difficult questions to resolve is the cost of alternative fuels in five to ten years that will provide a key determinant in the desirability of using Morocco's domestic renewable energy resources for selected uses. It is this cost that the policy makers must consider. If the cost is substantially higher, policy makers will have lost several years in their effort to reduce dependence on imported oil because an effective industry

cannot develop overnight, produce and market a technology. To the extent technologies appear commercially viable at today's prices, this is a strong indicator of future expanded viability.

We know that technical improvements are feasible to permit local manufacture of relatively inexpensive solar water heaters and wind pumps, based on actual experience in other countries. Cyprus, Tunisia, and Jordan, all of which are similar to Morocco in both climate and living conditions, possess active and expanding solar water heater industries. In Cyprus alone, over 300,000 square meters of solar collectors (approximately 100,000 separate units) are produced and sold each year, mostly for residential use. Similarly, windmills are a long established technology being improved through the recent work by CWD. Thus, the selection of these technologies for market development by CDER is soundly based.

Even though the analysis using current assumptions about price is positive, the critical question to be addressed by CDER and USAID revolves around whether these technologies are likely to receive Moroccan private investment to complement GOM encouragement, or whether investment will be totally public. In the case of the technologies selected, CDER has already received positive indicators. Six proposals were received by CDER concerning solar hot water heaters under the Small Projects Fund where a condition of financing is matching private sector investment. In addition, in the windmill pumping area, several firms have installed windmills in Morocco but the availability of low cost petrol fuels, and subsidized electricity have left many of them in bad repair or out of use. The CDER PREY program has been developed to respond directly to firms which want to expand their activities in this area.

The remote village energy system program constitutes a slightly different situation. For certain kinds of applications, photovoltaic systems for water pumping are the most cost-effective means of providing potable water to remote, wind-poor locations. International experience in water pumping suggests that, in the specific case of sites that are isolated, difficult to service, and which require only low-power applications (4-5 kWh/m<sup>2</sup>/day), photovoltaic systems represent the most economic and reliable means of meeting these end-user needs.

<u>B. Implementation Plan</u>	<u>target date</u>
PP Supplement Authorization	November 24
Project Agreement Amendment Execution	Mid-January
Technical Assistance Contracted	Nov.-Mar.
o Proposal for TA	Nov.-Dec.
o Interviews of team	Jan. 87
o Contract signed	March 87
CDER Management Decisions	Nov/Dec
o Implementation of IMEG Study	Nov.
o Hiring of Economist, Senior Engineer Doc Center Specialist	Feb 87.
Solar Hot Water Heater	
o Study Completed	March 87
o Begin Implementation	May 87
Wind Program Implementation	October 86
Remote Village Energy Systems	
o Program Details Negotiated	Oct/Dec 86
o CDER Implementation	Beginning March 87
Monitoring and Evaluation System	
o Study and Establishment	Sept/Nov 86
o Reporting System starts	March 87
Documentation Center	
o CDER Specialist in Place	December
o RTI study completed	Jan/Feb
o Procedures Established	March 87
o Center operational	July 86
<b>CDER Building</b>	
Building Completed	March 87
Solar hot water systems etc	January 87
o Contracts	February 87
o Installation	Jan/March 87
Equipment	
o Essential Equipment Ordered	January 87
o Lab Equipment list received	May 87
<b>Pilot Project Completion</b>	
Naika Procurement Contract	
o Review Bids	October 86
o Sign Contract	December 86
o Deliver Equipment	May 87
o Equipment operational	July 87

C. Procurement Plan:

The technical assistance will be financed under an 8(a) contract with IDEA, Inc, a firm specializing in the energy field. IDEA has a proven track record in Morocco of providing quality experts under the Energy Planning project, (under which the firm serves as a sub-contractor). USAID will request the Small Business Administration to negotiate a contract with IDEA which USAID plans to be ready for signature by March. To assure an effective working relationship between the TA team and CDER, the CDER director general will interview prospective members of the TA team prior to execution of the contract.

D. Evaluation Plan:

There will be one project evaluation, scheduled to take place in October, 1988. The evaluation will be conducted by a two person team consisting of a renewable energy technical specialist and an economic/marketing specialist. The purpose of the evaluation will be to assess progress to date in achieving project outputs, purpose, and goal and in making recommendations for project activities for the remainder of the project.

V. CONDITIONS PRECEDENT

The evaluation report placed strong emphasis on the need for CDER to complement its predominately technical staff with economic capability. CDER has had difficulty in the past in finding qualified people in this field, but recently has employed a senior economist. Continued employment by CDER and the strengthening of this capability is an important dimension of CDER's acquiring the competence to fulfill its role as described in this PP Supplement. Thus, USAID should have an undertaking from CDER in the form of a conditions precedent to disbursement requiring CDER to lay out in writing its plans for assuring this area is adequately addressed during the remaining life of the project.

The RII contract contains provision for technical assistance to CDEF to establish a viable documentation center which will constitute an important Moroccan resource for information on renewable energy. This aspect of the project will become fully operational as CDER's building approaches completion. To assure that CDEF accepts the documentation center implementation as a priority as outlined in this paper, USAID will include a condition precedent to disbursement on this point.

The following summarizes the conditions precedent to providing additional funds for the project under the forthcoming Project Agreement Amendment:

- A plan in form and substance satisfactory to AID to strengthen the economic analysis capability of CDER, including hiring of an economist as a counterpart to the technical assistance to be financed;
  
- A Plan in form and substance satisfactory to AID to make operational and strengthen the documentation center, including the employment by CDER of a qualified person to be responsible for the center;

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11/25/86

RENEWABLE ENERGY DEVELOPMENT PROJECT  
(608-0159)  
LOGICAL FRAMEWORK

ANNEX I

<u>NARRATIVE SUMMARY</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
<p><u>Goal</u></p> <p>Reduce Morocco's dependence on imported fuels by making maximum use of renewable energy resources while at the same time improving environmental conditions.</p>	<p><u>Measures of goal achievement</u></p> <ol style="list-style-type: none"> <li>1. Reduction of fossil-fuel energy demand through 1990, attributable to increase use of renewable energy.</li> <li>2. Energy conservation in urban residential and commercial sectors.</li> <li>3. Increase the use of renewable energy technology in urban and rural areas.</li> </ol>	<p><u>Program Goal</u></p> <p>Examination of national data, particularly data obtained through USAID-supported energy planning, agriculture, and health programs, primarily dealing with increased energy supply to rural areas, spoilage losses of perishable medicinals, and SWH share of water-heating costs.</p>	<p>Imported oil prices remain relatively expensive in relation to renewable energy costs.</p>
<p><u>Project Purpose</u></p> <p>To help the GOM create a Center for Renewable Energy Development (CDER) which has the capacity to assess and promote the potential of renewable energy in Morocco, and to support the wider participation of the private sector in disseminating economically viable renewable energy technologies.</p>	<p><u>Conditions that will indicate purpose achieved</u></p> <ol style="list-style-type: none"> <li>1. CDER building completed by July 1987.</li> <li>2. CDER staff with professional competence in both technical and socio-economic analysis.</li> <li>3. National recognition of CDER as source of technical, socio-economic, and environmental analysis of renewable energy systems.</li> <li>4. Wider use of renewable-energy resources in Morocco through increased manufacture and sales by the private sector.</li> <li>5. Existence of useful linkage between CDER and other GOM agencies, university research centers, and the private sector.</li> </ol>	<ol style="list-style-type: none"> <li>1. Assessment of CDER's facilities and staff.</li> <li>2. Evaluation of production/sales figures for renewable-energy equipment in Morocco.</li> <li>3. Data available on resource studies and end-use market analyses for renewable-energy in Morocco.</li> </ol>	<ol style="list-style-type: none"> <li>1. Private Sector finds manufacture and sales of locally produced SWH and pumps profitable.</li> <li>2. GOM continues to fund CDER.</li> </ol>
<p><u>Outputs: April 1, 1987 - Sept. 30, 1989</u></p> <p><u>A. Market Development:</u></p> <ol style="list-style-type: none"> <li>1. Solar hot water industry established</li> <li>2. Multi-blade windmills renovated, produced and maintained.</li> <li>3. Water pumpings systems established in remote villages.</li> </ol>	<p><u>Implementation Targets</u></p> <p>Large-scale SWH Systems in 3 urban areas. New and rehabilitated windmill pumpers in 3 provinces.</p> <p>2.20 Villages served by wind or photovoltaic pumps.</p>	<p>- Observation and assessment.</p> <p>- Reports on performance of installed renewable energy systems.</p>	

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## LOGICAL FRAMEWORK

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<b>B. Technology Assessment</b>			
1. Bio-orientation assessment.	Report Completed.	3. Reports on performance of installed renewable energy systems.	
<b>C. Institutional Support</b>			
1. Documentation center established.	Center operational and serving as focus for information on RE.	Direct observation and assessment by EOP Evaluation Team.	
2. CEPD building complete, with renewable energy technologies installed.		Direct observation.	

Inputs: April 1, 1987 - Sept. 30, 1989

1. Technical assistance: 2 long term US resident advisors 15 person months, short term consultants	1. \$ 980,000		
2. Consultant: 10 person months, part time training	2. \$ 120,000		
3. Equipment (hardware): Equipment for 4 facilities, 6 monitoring and control equipment for 2 facilities evaluation.	3. \$ 500,000		
4. Documentation Center: Equipment, Books, Periodicals Subscriptions, Microfilm Reader, Photocopier, Computer.	4. \$ 700,000		
5. Market Development Activities.	5. \$ 600,000		
6. Technology Assessment.	6. \$ 50,000		

Renewable Energy Development  
Second Project Evaluation  
November 1985  
Summary of Evaluation Findings and USAID/CDER  
Conclusions Concerning Recommendations

I Evaluation Summary

The following summarizes the progress to date in implementation of the project, as of November, 1985:

- (1) CDER as an institution: The evaluators reported that CDER has a staff and a budget, and is in the process of constructing its new headquarters in Marrakech. Given the budgetary constraints of Morocco, this is a significant achievement.
- (2) Technical assistance by two long-term and numerous short-term advisors: According to the evaluation, in some technical areas, such as wind, and micro-hydro, the assistance has been good. Technical assistance in the photovoltaic and solar thermal areas was less adequate and assistance in systems analysis, economics, and policy analysis was virtually absent.
- (3) The small projects fund (SPF): This fund was not yet operational at the time of the evaluation, although documentation available indicated that the SPF would be an effective catalyst to interest private entrepreneurs in investing in renewable energy technology in Morocco.
- (4) Pilot projects: Pilot projects have taken up an undue amount of USAID and Moroccan resources, and have distracted from the project's primary purpose of institution building and training, according to the evaluation team. Pilot projects include a 10 kilowatt wind generator at Sid Boulanouar, a 7 kilowatt photovoltaic system in Agadir Province, a 3.6 kilowatt photovoltaic system at the School of Mines in Marrakech, two 5 kilowatt wind generators in Naima-Oujda province, a micro-hydro system with a 200 kilowatt capacity in Taban, and a biogas digester on a private farm in Smaiba. Originally, pilot projects had been proposed only as a means for providing hands-on experience to CDER staff. During Phase I of the project, they gained in importance, have raised CDER's visibility, and have made it easier for CDER to keep the momentum for renewable energy going. However, they have also directed CDER's attention to purely technological issues, and may, in the long run, turn out to be the least effective component of the project.
- (5) Short and long term training in Morocco and in the U.S.: The evaluation reported that this component has been lagging throughout the project. CDER did not have a viable staff of its own that could have taken advantage of the training opportunities until late 1984. However, once the staff was hired, training should have been pursued more vigorously.

The evaluation made six major recommendations for improving and refocusing the project:

(1) CDER must define its mission: The evaluation concluded that CDER did not have a clear goal oriented plan for its activities and recommended that they develop a plan which would clearly outline what CDER is going to produce, why this product is important to Morocco, and how CDER will go about producing it. CDER must narrow down the scope of its activities to concentrate on a few promising technologies, and at the same time, broaden its approach to consider financial, economic, and sociological problems along with technological questions.

(2) CDER must strengthen its analytical capabilities: The evaluators determined that the CDER staff should develop more "analytical thinking" capabilities in areas such as economics, systems analysis, finance.

(3) The PACD should be conditionally extended: The report recommended that the PACD should be conditionally extended to enable CDER and its contractors to implement the recommended concentration and focus of activities, and to allow careful planning for a possible follow-on project.

(4) The project should be more carefully monitored: The evaluation team concluded that USAID should take a more active role in technical monitoring of the project through the establishment of a monitoring committee or a technical advisory board to assist the CDER directorate and advise its board of directors.

(5) New pilot projects should be reconsidered: The report indicated that pilot projects should be evaluated not on the basis of the energy they produce, but on the basis of the information they provide, the training opportunities they afford, or their demonstration effects.

(6) Improve quality control for CDER/RTI/A.T. Kearney Work Products: The evaluation recommended that RTI should make better use of the Institute's research professional staff in North Carolina for professional peer review in order to improve the quality of the project work products.

#### II USAID-CDER Agreement Concerning Recommendations:

The following pages indicate the results of CDER/USAID discussions and subsequent agreement addressing the recommendations in the project evaluation report.

RENEWABLE ENERGY DEVELOPMENT PROJECT  
 (608 - 0159)  
CDER/USAID CONCLUSIONS CONCERNING RECOMMENDATIONS  
OF  
PROJECT EVALUATION REPORT - NOV 1985

The following are the agreed conclusions between CDER and USAID concerning the recommendations in the evaluation report on the Renewable Energy Development Project (608-0159) prepared by Daniel F. Kohler for Energy/Development International (dated Nov. 1985). These conclusions are the result of discussions held Feb. 10-12, 1985 in Marrakech among S. Klein and S.M. Zoghby from USAID, and A. Fakhani, Director General of the CDER.

The sections below refer to the "Conclusions and Recommendations" section in Chap. V (pp. 42-49 of the English version) of the Evaluation Report.

I. USAID

A. THE PACD SHOULD BE CONDITIONALLY EXTENDED UNDER THE FOLLOWING CONDITIONS:

1. NO NEW TECHNOLOGY PROJECTS SHOULD BE UNDERTAKEN UNTIL MONITORING AND ANALYSIS OF THE CURRENT PROJECTS ARE WELL UNDERWAY.

Comment: Although USAID and CDER agreed in principle that the CDER should restrict its activities, both felt this recommendation to be too restrictive.

2. NO REGIONAL CENTER, STAFFED WITH CDER ENGINEERS, SHOULD BE OPENED.

Comment: Both USAID and CDER concurred.

3. A SENIOR ENGINEER SHOULD BE HIRED AS A COUNTERPART TO THE LONG-TERM TECHNICAL ADVISOR.

Comment: USAID concurred. CDER agreed, but pointed out that it is difficult to find such a senior person even if the Ministry of Finance (MOF) approves the new position. The matter will be taken up with MOF when the budget is prepared.

4. A TRAINING PLAN FOR THE CURRENT CDER STAFF SHOULD BE DEVELOPED WITH CLEAR-CUT GOALS AND INCENTIVES.

Comment: CDER pointed out that such a plan has been prepared. AID underlined the importance of implementing an effective training program.

5. A WORK PLAN SHOULD BE DEVELOPED, WITH CDER MANAGEMENT AGREEING TO CONSIDER IT AS BINDING ON ALL PARTIES CONCERNED.

Comment: CDER agreed that a Reformulation Team should prepare a work plan for the requested three-year project.

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**B. THE PROJECT SHOULD BE MORE CAREFULLY MONITORED.**

1. A MONITORING COMMITTEE OR TECHNICAL ADVISORY BOARD SHOULD BE CREATED.

Comment: Both CDER and USAID agreed on the need for better monitoring of the project. Neither agreed with the recommendation to create a monitoring committee. CDER and USAID agreed that the CDER's Director General, Secretary General, and Financial/Administrative Director on the one hand, and USAID's ENR Chief and Project Manager on the other, together constitute such a committee. It was agreed that USAID and the CDER will meet at least once a month either in Rabat or Marrakech. It was also agreed to explore creation of a Technical Advisory Board of technicians, industrialists, and financiers to meet twice a year, starting in Sept. 1986. We also agreed to consider creating a cooperation committee of the various donors collaborating with the CDER. ~~Meeting probably to occur in May-June 1986.~~

2. THERE SHOULD BE A PROFESSIONAL REVIEW OF PROJECT DOCUMENTS PRODUCED BY CDER AND R.T.A.T. NEARBY.

Comment: Both CDER and USAID agreed that we should insist on a quality product. However, an academic-type peer review was not considered the solution.

**C. NEW PILOT PROJECTS SHOULD BE RECONSIDERED.**

Comment: Both agreed that while pilot projects have been a part of phase I of the project, the Reformulation Team should be asked to consider whether additional pilot projects would be the best way to achieve project goals. We also discussed the possibility of financing "Pilot Projects" on condition that they directly support specified program objectives.

**D. THE PROPOSED EQUIPMENT PURCHASE SHOULD BE RECONSIDERED.**

1. USAID SHOULD REQUEST CDER TO REFORMULATE THE EQUIPMENT LIST FOR LABORATORIES AND WORKSHOPS.

Comment: Both USAID and CDER agreed that the list of equipment should be reviewed and, if necessary, revised before proceeding. The list should be reformulated to reflect the activities of the CDER.

**E. THERE SHOULD BE MORE EMPHASIS ON THE IMPORTANCE OF TRAINING.**

1. TRAINING SHOULD BE PRIMARILY IN BUSINESS, OPERATIONS RESEARCH, ECONOMICS, AND CONTACT SKILLS.

Comment: Both USAID and CDER agree that such training is essential as part of a broader training program. CDER pointed out

the paucity of CDER personnel with skills in these disciplines. USAID pointed out that the CDER might consider contracting with university graduates to be trained in these disciplines at the graduate (M.S.) levels and then to join CDER as civil servants. CDER agreed in principle.

2. NO MORE WAIVERS FOR THIRD-COUNTRY TRAINING SHOULD BE GRANTED.

Comment: While accepting the thrust of the recommendation, both USAID and CDER disagreed with too rigid an application of its tenets.

3. THE CURRENT LIST OF FTE/ATE CONSULTANTS DOES NOT INCLUDE PERSONS WHO SEEM QUALIFIED TO TEACH IN RELEVANT FIELDS.

Comment: CDER noted that while some were good, others were indeed inadequate. USAID emphasized the need for FTE to provide qualified teachers.

F. A MORE FOCUSED FOLLOW-ON PROJECT SHOULD BE PLANNED.

1. THE FOLLOW-ON PROJECT SHOULD BE BUILT AROUND TECHNICAL ASSISTANCE AND TRAINING, WITH EMPHASIS ON ECONOMIC, SYSTEMS ANALYSIS, AND POLICY ANALYSIS.

2. THE NEW PROJECT SHOULD BE UNDER A MISSION DIRECT CONTRACT INSTEAD OF A HOST-COUNTRY CONTRACT.

Comment: Both USAID and CDER agreed to propose a Reformulation Team to prepare a detailed and focused three-year work plan that would include strong training and technical assistance components with an emphasis on economics and systems analysis. Neither CDER nor USAID saw the need to revise the present contracting mode, but did accept the need for close cooperation between the CDER and USAID on project goals and implementation.

3. THE CREATION OF A PROFESSIONAL ADVISORY PANEL SHALL BE CONSIDERED.

Comment: (See Section 2.F.)

II. CDER

A. CDER MUST DEFINE ITS MISSION.

Comment: Both USAID and CDER agreed with this recommendation. USAID pointed out that its phase of exploration has come to an end and that it should now have a better focus and a selective approach to renewable-energy technologies. CDER pointed out in Section 2.F, it was agreed to propose formation of a Reformulation Team to prepare a three-year work plan.

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**B. CDER MUST STRENGTHEN ITS ANALYTICAL CAPABILITIES.**

Comment: Both agreed with the recommendation and have included in the Terms of Reference for the Reformulation Team the need to emphasize such training in the CDER work plan.

**C. CDER MUST CONCENTRATE ITS EFFORTS AND RESOURCES.**

1. APPOINTMENT OF SENIOR ENGINEER TO SERVE AS TECHNICAL ADVISOR TO THE STAFF WOULD BE HELPFUL.
2. CDER SHOULD HAVE NO REGIONAL CENTERS.

Comment:

1. Both agreed. (See Section I.A.3.)
2. Both agreed. (See Section I.A.2.)

**D. CDER SHOULD CONTINUE COOPERATION WITH UNIVERSITIES.**

Comment: Both USAID and CDER agreed. CDER pointed out that it has cooperation agreements not only with the universities, but also with the Regional Agricultural Development Organizations (Office Regional de la Mise en Valeur) to implement appropriate renewable-energy technologies. CDER is also planning to collaborate with the National School of Architecture of Rabat as a result of USAID contacts with the school. CDER is requesting short-term U.S. technical assistance to help the school address energy considerations in architecture. USAID also pointed out the need for linkages with U.S. renewable-energy institutions.

**E. CDER SHOULD ASSIGN RESPONSIBILITIES TO INDIVIDUALS.**

1. THE ORGANIZATION OF CDER SHOULD BE RESTRUCTURED ALONG PROJECT LINES.

Comment: Although the CDER recognized the need for effective management, its response to this recommendation by saying that the evaluators were interfering in the internal affairs of the CDER is not a valid management practice.

2. THE D.M.E.G. MANAGEMENT COMMITTEE SHOULD BE REORGANIZED TO BE MORE EFFECTIVE.

Comment: The CDER proposed to study the D.M.E.G. administrative structure of the CDER with USAID.

**F. CDER MUST HAVE COUNTERPARTS FOR THE LONG-TERM ADVISORS.**

1. CDER SHOULD PROVIDE AT LEAST ONE COUNTERPART TO THE FIRST LONG-TERM TECHNICAL ADVISOR.

Comment: Both USAID and CDER agreed. The CDER pointed out, however, that current personnel constraints mean that at the moment Mr. M'Zabi, the Secretary General, and Mr. Fakihani, the Director General, must play a number of roles in addition to their principal responsibilities. This means that they are temporarily effectively acting as counterparts to the long-term advisors - both managerial and technical - of RTI. (See also Section I.A.3.)

### III. RTI/A.T. KEARNEY

#### A. RTI SHOULD KEEP THE CURRENT LONG-TERM ASSISTANCE IN PLACE.

Comment: Both CDER and USAID agreed to propose that the RTI contract be extended for an additional six months to allow RTI sufficient time to complete procurement services and key analytical work. A six-month extension would also allow sufficient time for transition to a new technical assistance contract (which could be with RTI if it is successful in the competitive process).

#### B. WITH REGARD TO SHORT-TERM ADVISORS, THE EMPHASIS SHOULD BE SHIFTED TOWARDS ANALYTICAL SKILLS.

Comment: Both agreed.

#### C. THERE SHOULD BE EFFECTIVE QUALITY CONTROL OVER CDER/RTI/A.T. KEARNEY WORK PRODUCTS.

Comment: Both agreed. (See Section I.B.2.)

#### D. THE FOCUS OF TRAINING SHOULD BE CHANGED.

##### 1. THE EMPHASIS SHOULD BE ON BUSINESS, OPERATIONS RESEARCH, ECONOMICS, AND SYSTEMS ANALYSIS.

Comment: Both agreed to concentrate training in these disciplines. The CDER pointed out that RTI has already started a course on systems analysis and project implementation. (See also Sections I.E.2 and 3 below.)

##### 2. ENGLISH LANGUAGE TRAINING SHOULD BE VIGOROUSLY PURSUED.

Comment: Both agreed. USAID reported on its contacts with Peace Corps to provide a full-time TEFL (Teaching English as a Foreign Language) teacher to the CDER starting Sept. 1988. CDER accepted the proposal, stating that it has received a letter from Peace Corps confirming the proposal.

##### 3. THERE SHOULD BE NO THIRD-COUNTRY TRAINING.

Comment: (See Section I.E.2.)

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UNITED STATES GOVERNMENT  
memorandum

DATE: November 25, 1986

REPLY TO  
ATTN OF: Stephen Klein, Chief Office, ENR *Stephen Klein*

SUBJECT: Renewable Energy Development - PP Supplement

TO: See Distribution

Attached for your information is the penultimate draft of the PP Supplement for the CDER project.

CDER will be discussing the report with its Board of Directors at a meeting Dec. 8.

During negotiations in Marrakech Nov 12-13, CDER officials objected to the CP re hiring of a technical engineer. We expect to receive a request to eliminate this CP with supporting argumentation that I found quite strong.

As soon as we receive CDER's reactions, and delegation of authority from AID/W to sign the agreement, we will circulate the final copy of the PP Face Sheet for approval.

Distribution:

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