PD-AAZ-644

APR 21 1989

ACTION MEMORANDUM FOR THE AGENCY DIRECTOR FOR ENERGY AND NATURAL RESOURCES

FROM: S&T/EY, James B. Sullivan James B. Sullivan

SUBJECT: Approval of the Project Paper for the Private Sector Energy Development Project

PROBLEM: Your approval is needed for the funding of the Private Sector Energy Development Project, 936-5738.

Discussion: On July 11, 1988 the Senior Assistant Administrator, Bureau for Science and Technology, Nyle Brady, approved the concept paper to design the Energy Market Development Project. Since that time, the name of the proposed project has changed to the Private Sector Energy Development (PSED) Project. On December 14, 1988 you approved the Project Identification Document for the PSED Project and authorized the Office of Energy to develop a Project Paper. The PSED Project as designed is a six year, $15.34 million project, with a total of $9.76 million in core funding from S&T/EY and $5.58 million in buy-ins from Missions, Regional Bureaus, Offices, and the private sector.

The project paper was reviewed and endorsed by the Energy Sector Council on March 3, 1989. Our analysis has revealed potential buy-ins from the Regional Bureaus and selected Missions (Dominican Republic, Pakistan, the Philippines, Thailand and Costa Rica). Also, U.S. energy industry companies have expressed strong interest in providing matching funds to participate in the proposed Feasibility Study Fund. The level of Mission and Regional buy-ins is projected to be $3.28 million, while private sector buy-ins have been projected at $2.30 million.

Approval of the PSED Project will assist in creating a favorable environment to encourage the private ownership, financing and operation of energy facilities in selected developing countries, concentrating on the electric power sector. The proposed project has resulted from several years of policy dialogue with host countries on the need to increase the role of the private sector in their energy sectors, particularly electric power. The PSED Project generally follows the proposed "Private Sector Electric Power Strategy" outlined in the A.I.D. report to Congress Power Shortages in Developing Countries: Magnitude, Impact, Solutions and the Role of the Private Sector. Consequently, the PSED Project will endeavour to help host countries examine and improve their national energy/power sectors by harnessing the capabilities of the private sector, as a means of creating a stronger base for economic and social development in these countries.

An advice of Program Change was approved on March 8, 1989, CN 146, for this new project. The FY89 OYB is $1,797,000.

Recommendation: That you sign the attached PAF authorizing the Private Sector Energy Development Project for six years with life of project central funding of $9.76 million and $5.58 million in estimated buy-ins.

Attachments:
1. Approved Concept Paper
2. Approved Project Identification Document
3. Project Paper
4. Project Authorization Form
5. Project Data Sheet
6. Memorandum in Response to S&T/PO Memorandum of March 31, 1989

Clearances:
S&T/PO, DSheldon DS for Date: 5/10/89
GC/CP, STisa [Cleared in Draft] S.R. Tisa Date: 5/9/89

Project Authorization

Name of Country/Entity: Worldwide

Name of Project: Private Sector Energy Development Project

Number of Project: 936-5738

1. Pursuant to Section 103 and 106 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Private Sector Energy Development Project for worldwide application involving planned obligations of not to exceed $9,760,000 in grant funds over a six year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.

In addition, A.I.D. Missions, Offices and Regional Bureaus may contribute up to $5,580,000 of funds authorized under section 103, section 106, the Development Fund for Africa, and the Economic Support Fund to help in financing costs for this project. The planned life of the project is six years.

2. The project consists of: 1) Analysis of the potential for, and impediments to private energy/power in selected A.I.D.-assisted countries; (2) Studies on selected topics pertinent to the development of private energy/power policies such as the need for capital markets in the development of private energy/power subprojects, and the economic impact of private energy/power on the national economy; (3) Technical assistance in preparing and implementing policies, rules, regulations and guidelines that are necessary for the implementation of private energy/power subprojects; (4) Training, Internships and Study Tours in the United States for officials of state-owned utilities; (5) Information dissemination through private energy/power conferences, workshops and seminars, and a private energy/power database; and (6) Cost sharing feasibility studies and other studies necessary for the development of private energy/power subprojects. The PSED Project will also seek to establish collaborative arrangements between the various U.S. government agencies, bilateral donors, and multilateral development banks active in the energy/power sector of A.I.D.-assisted countries.

3. The Project Agreement(s) which may be negotiated and executed by the officer(s) to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

4. a. Source and Origin of Commodities, Nationality of Services

Commodities financed by A.I.D. under the project shall have their source and origin in the Cooperating Country or in the United

States except as A.I.D. may otherwise agree to in writing.[1] Except for ocean shipping, the suppliers of commodities or services shall have the Cooperating County or the United States as their places of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the Cooperating Country or of the United States.

b. The following waivers to A.I.D. regulations are hereby approved: NONE

Name	Office Symbol	Date	Initials
Clearances:			
A. JBSullivan	S&T/EY	4-21-89	
B. DSheldon	S&T/PO	5/10/89	
C. SRTisa	GC/CP	5/9/89	[Cleared in Draft]S.R. Tisa

Signature _____

Jack Vanderryn
Agency Director for Energy
and Natural Resources
Bureau for Science and Technology

Date: 5-15-89

[1] Each country in Code 935 in which project activities are conducted is deemed a cooperating country for the purpose of procuring goods and services required for the activity conducted in that country.

AGENCY FOR INTERNATION EVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION C — [ ] A = Add, C = Change, D = Delete — Amendment Number: _____ — DOCUMENT CODE: 3

2. COUNTRY/ENTITY: Worldwide

3. PROJECT NUMBER: 936-5738

4. BUREAU/OFFICE: S&T/Office of Energy

5. PROJECT TITLE (maximum 40 characters): Private Sector Energy Development

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 09 DD 30 YY 94

7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4): A. Initial FY 89 — B. Quarter 2 — C. Final FY 93

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

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. Total	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. Total
AID Appropriated Total						
(Grant)	(1,797)	( )	( )	(9,760)	( )	(9,760
(Loan)	( )	( )	( )	( )	( )	(
Other U.S. 1.						
Other U.S. 2.						
Host Country Buy-Ins				5,580		5,580
Other Donor(s)						
TOTALS	1,797			15,340		15,340

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	C. PRIMARY TECH. CODE 2. Loan	D. OBLIGATIONS TO DATE 1. Grant	D. OBLIGATIONS TO DATE 2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	E. AMOUNT APPROVED THIS ACTION 2. Loan	F. LIFE OF PROJECT 1. Grant	F. LIFE OF PROJECT 2. Loan
(1) PSEE	744	878				9,760		9,760	
(2) ARDN									
(3)									
(4)									
TOTALS						9,760		9,760	

10. SECONDARY TECHNICAL CODES (maximum 5 codes of 3 positions each): 640 | 810 | 710 — 11. SECONDARY PURPOSE COD

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	DEL	INTR	BU	TNG			
B. Amount							

13. PROJECT PURPOSE (maximum 480 characters)

The purpose of the PSED Project is to assist in creating a favorable environment to encourage the private ownership, financing, and operation of energy facilities in developing nations, concentrating on the electric power sector.

14. SCHEDULED EVALUATIONS: Interim MM 09 YY 91 — Final MM 09 YY 94

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)

This is a new project that was not orginally proposed in the CP for 1989.

17. APPROVED BY — Signature: Jack Vanderryn — Title: Agency Director, Energy and Natural Resources — Date Signed: MM 05 DD 15 YY 89

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTIO — MM DD YY 5

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT (PSED)

PROJECT NUMBER 936-5738

OFFICE OF ENERGY
BUREAU FOR SCIENCE AND TECHNOLOGY
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
MAY 1989

UNCLASSIFIED

Project Paper

Private Sector Energy Development Project (PSED)

Project Number 936-5738

Office of Energy
Bureau for Science and Technology
U.S. Agency for International Development
May 1989

UNCLASSIFIED

Private Sector Energy Development Project
936-5738

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

A.I.D. -	Agency for International Development
ADB -	Asian Development Bank
ARDN -	Agriculture and Rural Development and Nutrition
CORECT -	Committee on Renewable Energy Commerce and Trade
DOC -	Department of Commerce
DOE -	Department of Energy
EXIMBANK -	Export-Import Bank of the United States
FERC -	Federal Energy Regulatory Commission
FOIA -	Freedom of Information Act
GW -	Gigawatt
GDP -	Gross Domestic Product
IDB -	Interamerican Development Bank
LDC -	Lesser Developed Country
MW -	Megawatt
OECD -	Organization of Economic Cooperation and Development
OJT -	On-the-Job Training
OPIC -	Overseas Private Insurance Corporation
PASA -	Participating Agency Service Agreement
PID -	Project Identification Document
PSED -	Private Sector Energy Development (Project)
PSEE -	Private Sector Energy and Environment
PUC -	Public Utility Commission
PURPA -	Public Utility Regulatory Policy Act
RSSA -	Resource Support Service Agreement
TA -	Technical Assistance
TAG -	Technical Advisory Group
TDP -	Trade and Development Program
WB -	The World Bank

I. PROJECT SUMMARY AND RECOMMENDATIONS

A. Recommendations

1. Funding

The Office of Energy, Bureau for Science and Technology, recommends the authorization of $15.34 million for the Private Sector Energy Development Project, 936-5738, with a Project Assistance Completion Date of September 30, 1994. The Office of Energy will contribute $9.76 million in core funding for the PSED Project. An additional $5.58 million of matching funds and joint funding will be sought from relevant A.I.D. Bureaus, Missions, other U.S. government agencies, other bilateral and multilateral donors, and from the private sector. The Office of Energy funding is planned to be incrementally obligated as follows:

FY	PSEE/ARDN Funding (000)
89	1,800
90	1,950
91	1,900
92	1,750
93	1,400
94	-0-
	9,800

It is expected that over the lifetime of the PSED Project buy-ins from A.I.D. Regional Bureaus and Missions will amount to $3.3 million. The PSED Project anticipates an additional $2.3 million worth of costsharing from the private sector and other sources in the form of matching funds for feasibility and prefeasibility studies and other subproject development assistance. Monies expended by the Feasibility Study Fund on successful subprojects would be reimbursed to the U.S. Treasury, unless other arrangements are approved. (As used in this Project Paper, the term "subproject" refers to the energy facilities supported by the Feasibility Study/Subproject Development Assistance Fund, e.g., a new power generating plant).

2. Waiver Requests and Determinations

None.

B. Project Summary

The goal of the six-year PSED Project is to accelerate the sustainable economic and social development of A.I.D.-assisted countries by increasing the supply of reliable, affordable energy, particularly electric power, for productive purposes.

The purpose of the PSED Project is to assist in creating a favorable environment to encourage the private ownership, financing and operation of energy facilities in selected developing countries, concentrating on the electric power sector.

The proposed PSED Project has resulted from several years of policy dialogue with host countries on the need to increase the role of private enterprise in their energy sectors, particularly in electric power. The PSED Project generally follows the the proposed "Private Sector Electric Power Strategy" outlined in the A.I.D. report to Congress, Power Shortages in Developing Countries: Magnitude, Impact, Solutions and the Role of the Private Sector. The current shortages of energy, especially electric power, are curtailing economic growth in most A.I.D.-assisted countries, because prospects for growth are closely related to the provision of adequate and reliable supplies of modern forms of energy. Activities as diverse as industrial expansion, commercial enterprise, agricultural development, health services improvement, and educational development are closely linked to the availability and reliability of electric power and other forms of modern energy. Consequently, the PSED Project endeavors to help host countries examine and improve their national power sectors by harnessing the capabilities and resources of the private sector, as a means of creating a stronger base for economic and social development in these countries.

The PSED Project will consider a number of strategy options through which the private sector could increase its role in energy development, such as the following:

- o Private sector participation in generation and distribution of power and development of other energy resources;
- o Industrial and commercial cogeneration of power;
- o Long-term contracts by the utility for private companies to perform certain functions;
- o Investment of private capital in power and other energy facilities;
- o Privatization of existing public utilities and other energy operations;
- o Participation of private companies in the decentralization of rural electric power systems.

The PSED Project will make funds directly available to private enterprises for feasibility studies supporting private

energy development in A.I.D.-assisted countries. The PSED Project will also provide direct technical assistance (TA) to developing countries to implement policies and enable host country institutions to encourage private power generation. TA will include targeted training, workshops, legal assistance and regulatory advice. The PSED Project will undertake a number ofspecial studies on subjects pertinent to advancing private sector participation in selected developing countries. Finally, the PSED Project will endeavour to establish collaborative relationships with other U.S. agencies, multilateral development banks and other bilateral donors to encourage private sector energy development.

The major expected outputs include assistance in the reform or design of laws, policies and institutions to allow and encourage private participation in the energy sector, and assistance to private companies in the preparation of prefeasibility and feasibility studies through a Feasibility Study and Subproject Development Assistance Fund (referred to as the Feasibility Study Fund).

As a result of participation in the prefeasibility and feasibility phases and related activities, this project should act as a catalyst for an investment of $500 million of private capital for environmentally sound new generating capacity or major rehabilitation in five or more power plants ranging from 20 to 200 megawatts with a total capacity of 500 megawatts. The Project will also assist small scale power facilities and operations, as well as non-electric power, private energy activities.

The PSED Project supports the Office of Energy's Program Plan objective to foster private enterprise energy development and management by promoting policy reform to improve the functioning of energy markets, building local private sector capabilities, and increasing the flow of technical and financial resources from the U.S. private sector. (Office of Energy, "Program Plan - Fiscal Years 1988 and 1989").

The Office of Energy plans a commitment of 9.76 million over the six-year PSED Project period. An additional 5.58 million of buy-ins and matching funds will be sought from relevant A.I.D. Bureaus, Missions, other U.S. government agencies, other bilateral and multilateral donors, and from the private sector.

C. Summary Findings

The PSED Project is ready to be implemented. It is socially, financially, economically sound, and administratively and technically feasible.

II. PROJECT DETAILS

A. Project Rationale

A.I.D.'s main concern is sustainable economic development and social growth. Within each country there needs to be a fundamental evolution of social and economic life that will makeit possible for the country to meet the needs of its own people, on a sustained basis, ultimately out of its own material and human resources. To this end, there must be an expansion of productivity, income, and employment.

Power shortages in developing countries, however, are preventing such an expansion. A.I.D. has outlined four approaches to development assistance that will help developing countries overcome obstacles to sustainable economic development: policy dialogue, institutional development, technology research, development and transfer, and utilization of the private sector.

The PSED Project will use each of these approaches in helping to alleviate power shortages developing countries. The Project will facilitate policy reform by providing technical assistance to countries in drafting laws, regulations and guidelines that will allow the participation of the private sector in the energy/power sector. Institutional development will be addressed through workshops and conferences on private power, internships with U.S. utilities, utility commissions and private power facilities, and study tours of U.S. private power facilities that will be available to developing country government and utility officials. The project will promote the transfer of cogeneration and other private power technologies from the U.S. to A.I.D.-assisted countries. The overall objective of the PSED Project is to utilize the technical, financial and managerial skills of the private sector to improve the energy/power sector of A.I.D.-assisted countries.

In addition to these approaches, the PSED Project will stress better management of the energy/power infrastructure, development of the capital markets vital to private participation in the energy/power sector, and improved economic cooperation between the U.S. energy industry and A.I.D.-assisted countries.

A.I.D-assisted countries need more electrical energy than they are currently able to produce in order to support sustained economic growth. Many of these countries are presently spending 25 to 40 percent of their total development budgets on energy, primarily in the electric power sector. However, as discussed below, current spending will not fulfill the investment

requirements necessary for sustaining the needed electricity generation capacity. Furthermore, any additional increases in power sector spending by these countries will correspondingly decrease the funds available for other development programs, thus constraining the overall development of these countries in crucial areas such as education, health care, housing, and agriculture.

Economic development is tied strongly to the consumption of energy, specifically, high level energy. Long-term economic development trends illustrate that one percent increases in per capita income correspond to 1 - 1.3 percent increases in the useof energy services per capita and as a much as two percent increases in per capita modern energy use (i.e., electricity, and liquid and gas fuels). (A.I.D., Power Shortages in Developing Countries, March 1988). Large increases in demand, however, cannot be satisfied with the capacity and reliability of the current power supply. In fact, in many developing countries, increases in demand for electric power have resulted in power shortages and load shedding which further impede the growth of the economy.

Currently, developing countries, which represent over 75 percent of the world's population, consume only 18 percent of the electricity used in the world. Such disparities of supply and demand of electric power in developing countries combined with the poor quality and reliability of existing electric power systems have significantly constrained developments in agriculture, health services, and industry, and the resulting standards of living. Growing demand for electric power in developing countries must be countered by adequate supplies of power to satisfy citizens' demands, to strengthen the economy and social infrastructure, and to ensure political stability.

To study the power sector requirements of the developing countries, scenarios were modeled and analyzed for the years 1988 through 2008. (A.I.D., Power Shortages in Developing Countries, March 1988). Each scenario reflects a particular trend in power production and consumption at a specified economic growth rate. The analysis of current trends in production and utilization of electric power (the Current Trend Scenario) suggests that the developing countries would require an estimated 1,500 gigawatts of additional generation capacity by the year 2008 to support moderate economic growth of 4.5 percent per year. This increase in capacity would cost over $2.6 trillion, or an average of $125 billion per year. Developing countries cannot bear this financial and economic burden alone.

Under the Conservation Scenario, financial and capacity requirements are reduced. This scenario assumes that efficiency gains in both production and utilization of power are realized. Generation capacity requirements are reduced to 1,200 GW and corresponding financial investments are reduced to $75 - $110 billion per year. By comparison, only $50 - $60 billion is currently spent on the power sector each year. Considering that this figure represents approximately 25 to 40 percent of many countries' development budget, other sources of capital -- specifically, private investment -- are necessary to support the required power development.

To reduce this financial burden many countries are exploring prospects for private sector participation in power generation. Pakistan, the Philippines, Thailand, India, and Indonesia all have legislation permitting the generation of electric power by the private sector. In addition, legislation permitting private sector participation in the energy sector is currently pending in both the Dominican Republic and Costa Rica. The Office of Energy is aware of over eighty proposals for private power projects that have resulted from these legislative initiatives.

A.I.D.'s field missions and its ability to develop innovative projects are valuable assets that make A.I.D. unique among donors in its ability to address developing country energy/power sector problems. A.I.D. has been a leader in promoting private sector participation in the energy/power sector of developing countries. This leadership has catalyzed interest in private power among multilateral development banks and other bilateral donors. For example, A.I.D./Santo Domingo is preparing to fund a modest loan program to help finance privately financed, constructed and operated electric power plants using economic support funds. This is expected to trigger similar funding commitments for private sector power projects from the World Bank and the Inter-American Development Bank. In Pakistan, A.I.D. has joined a consortium of donors and the World Bank to establish a loan pool for private energy/power projects as well as funding technical assistance for capacity building within the state-owned utility and local financial intermediate financial institutions. The PSED Project will seek to expand these models of leadership and resource leveraging with other donors in other A.I.D.-assisted countries.

A major priority in the United States is to improve U.S. foreign trade. By promoting private power investment in A.I.D.-assisted countries, the PSED Project addresses this crucial issue through use of indigenous expertise. The U.S. utility industry and regulatory bodies are preeminent in integrating public and private power systems, and furthermore, U.S. industry has a competitive advantage in a number of power

technologies. Thus, in addition to the major rationale discussed above, trade and investment interests of U.S. industry are likely to benefit from the PSED Project.

A.I.D.'s strong interest in private sector and advanced industrial development support its role in this Private Sector Energy Development Project. A.I.D. has promoted programs to improve health care, agricultural productivity, industrial expansion, and overall living conditions. A.I.D.'s promotion of private investment in the power sector through the PSED Project can increase funds available for these other government priorities, thus helping to improve socioeconomic conditions through an improved energy supply.

B. Goal, Purpose and Objectives of Project

1. Goal

The goal of the six-year PSED Project is to accelerate the sustainable economic and social development of A.I.D.-assisted countries by increasing the supply of reliable, affordable energy, particularly electric power, for productive purposes.

2. Purpose

The purpose of the PSED Project is to assist in creating a favorable environment to encourage the private ownership, financing and operation of energy facilities in selected developing countries, concentrating on the electric power sector.

3. Objectives

To achieve the goal and purpose, the PSED Project has three objectives:

a. Induce policy reform and institutional development supportive of private participation in the energy sectors of developing countries. The PSED Project will utilize Country Assessments, Special Studies, Conferences and Workshops, Technical Assistance Teams, Training Courses, Internships, Regional Energy Consultants, and Study Tours to achieve this end.

b. Assist in private energy project development, especially in the electric power sector. While employing Technical Assistance Teams and Special Studies to reach this end, the Project will rely primarily on the Feasibility Study Fund to promote greater private sector involvement in site specific, energy subprojects.

c. Improve coordination and use of U.S. government resources by the private firms seeking involvement with the energy and power systems of developing countries. The operation of the Technical Advisory Group -- with representation from across A.I.D., other U.S. government agencies and the private energy sector -- coupled with Conferences, Workshops and Special Studies are intended to help achieve this end.

C. Project Elements

A.I.D.-assisted countries are at various levels regarding their willingness and ability to accept private sector participation in their energy and power sectors.

Many countries have public policies, regulations and practices that prohibit or discourage such private sector involvement. Therefore, the PSED Project inputs and activities listed below will be packaged and targeted according to three different levels: low, medium and high levels of ability and willingness to accept and implement private participation in their energy sectors. The PSED Project will initially categorize these countries into levels based on assessments of their legal and regulatory systems, financial markets, health of their economies, technical state of existing energy and power facilities and their utilities, and the level of host government interest in private sector participation in power generation (See Annex J).

In those countries where there is low acceptability of private sector participation, such as in some African nations, Country Assessments, Conferences and general Workshops might be the primary activities. In countries where there are moderate levels of acceptance, Workshops, Study Tours, Technical Assistance Team visits and prefeasibility studies will be used to increase the level of readiness for private participation. In those countries where there exists a high level of interest, acceptability and readiness for private sector participation in the energy and power sector, the PSED Project will offer Feasibility Study funds for specific subprojects and targeted Technical Assistance along with the other activities outlined above.

It is not anticipated that the PSED Project will involve activities affecting the physical environment, because the Project will finance only technical assistance, training and feasibility studies. Of course, the actual construction of electric power generation, and transmission facilities, which themselves are outside the scope of this project, may have significant impacts on the environment. However, due to A.I.D.'s

commitment to sound environmental practices, appropriate training and technical assistance activities will address environmental concerns. In addition, to the extent the Project would also support feasibility studies possibly leading, at some future time, to the construction of facilities, such studies would incorporate attention to environmental aspects of the proposed energy activities as appropriate.

The number and magnitude of project outputs are based on the Office of Energy's past experience in the field of private power through the Energy Conservation and Services Project and through discussions with the Missions. For example, the Regional Energy Consultant to be funded at $250,000 per year for four years, is based on conversations with the Missions in Indonesia, Thailand, and the Philippines. These Missions have expressed an interest in having Mission energy officers but do not have the funding available to support them.

Over the last three years S&T/EY has done country assessments in Pakistan, Indonesia, Thailand, Costa Rica, India, the Dominican Republic, and the Philippines ranging in cost from $75,000 - $250,000.

Technical assistance teams have been dispatched to the Philippines, Costa Rica, the Dominican Republic, Pakistan and India over the last three years. The cost for these technical assistance teams have ranged from $15,000 - $35,000.

In the past, S&T/EY has employed a technical assistance group to advise the ECSP project. This group is no longer functioning.

S&T/EY has held private power workshops/conferences in the Dominican Republic, Indonesia, Costa Rica, and the Philippines over the past two years ranging in cost from $50,000 - $150,000.

The Office is entertaining requests for study tours from Jordan, the Philippines, the Dominican Republic and Indonesia. S&T/EY has recently conducted a study tour from Costa Rica.

In the past the Office has completed special studies on potential impediments to private power, computer models analyzing private power projects and the Power Shortages in Developing Countries report. The cost of these studies has ranged between $50,000 and $200,000.

The budget for the core staff is based on the existing Office of Energy contract with the 8a firm of IDEA which employs two professionals and one support staff.

PRE bureau has experience in studies advancing the role of the private sector in developing countries and in direct funding of private sector projects through their loan guarantee program. The PRE bureau is also funding the Center for Privatization, which will be approached by S&T/EY where privatization presents a viable option.

The Trade and Development Program has a feasibility study loan program in effect. The Office of Energy has worked closely with TDP, and, in the past has cofunded a number of studies with that agency. TDP has been consulted on the design, structure and operation of the PSED Feasibility Study Fund.

As mentioned, A.I.D. has been involved with the World Bank in Pakistan and has been in discussion with the IFC, ADB, and IDB on coordinating private sector project financing.

It is the intention of the project to focus on medium scale projects. Small scale projects will be considered, however, if they contribute to improving the energy situation of A.I.D.-assisted countries or if they significantly advance the role of the private sector in energy development. The purpose of the project is to "increase the supply of reliable and affordable energy." The activities of the project by no means diverge from the purpose of the project.

1. Description of Nature and Scope of Inputs and Actions to be Taken During Project

a. Country Assessments

An initial component of the PSED Project will be the preparation of Country Assessments of the potential for, and barriers to, private sector participation in the energy/power sector and distribution in A.I.D.-assisted countries. These assessments will (1) identify the market and economic potential for private sector power production, distribution and other energy development sources; (2) identify the policy/regulatory/institutional and other impediments to private sector power participation; and (3) develop recommendations and an action plan for addressing impediments.

The PSED Project plans to complete six (6) Country Assessments.

b. Feasibility Study/Subproject Development Assistance Fund

The PSED Project will establish the Feasibility Study/Subproject Development Assistance Fund to share with private developers the cost of prefeasibility, feasibility and other subproject assistance activities for private subprojects in A.I.D.-assisted countries. Feasibility study funding for public sector energy subprojects with a substantial opportunity for private sector investment will also be available, e.g., funding for a state owned utility to study the feasibility of privatizing its operations. Both private and public sector studies would include an analysis of the technical, legal, financial, and environmental aspects of subprojects. Monies expended by the Feasibility Study Fund on successful subprojects would be reimbursed to the U.S. Treasury, unless other arrangements are approved.

Often there is no clear distinction between where a prefeasibility activity ends and a feasibility study begins. Generally, however, prefeasibility activities leads to general project definition and identification of multiple proposed subproject sites and technologies, while a feasibility study is usually specific to a given site and technology.

Prefeasibility activities generally involve research on the regulatory, financial and technological aspects of private power to help identify a suitable location and the parameters of a subproject. Feasibility activities, however, could include investigating in detail electricity pricing, legal requirements and environmental impacts and mitigation measures, subproject design, engineering and cost estimates and financial planning. Some of the other eligible project assistance activities would include detailed engineering, operation and maintenance plans, contract preparation, technology assessments and testing programs.

Some illustrative criteria for selecting eligible subprojects include the likelihood of project implementation, the level of private sector costsharing contribution (the PSED would seek, where appropriate, 50/50 public to private costsharing) and the importance of the subproject in advancing the private sector participation in the energy sector. The Feasibility Study Fund would be available to firms from the U.S. and developing countries.

With the proposed resources, the PSED Project could cost share approximately 25 studies.

ANNEXES

TO

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT (PSED)

PROJECT NUMBER 936-5738

OFFICE OF ENERGY

BUREAU FOR SCIENCE AND TECHNOLOGY

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

B'

List of Annexes for PSED Project Paper

A. PID Approval Message

B. Log Frame Matrix

C. Statutory Checklist

D. Project Technical Analysis

E. Project Financial Analysis

F. Project Economic Analysis

G. Social Soundness Analysis

H. Project Administrative Analysis

I. Project Environmental Analysis

J. Country Assessment Matrix for Potential Private Sector Energy Development

K. Private Power Conference and Workshop Agendas

L. List of Interviews for PSED Project Paper

M. Issues Paper for Project Identification Document

N. Statement of Work for Feasibility Fund Contract

ANNEX A

PID APPROVAL MESSAGE

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D C 20523

MEMORANDUM

December 14, 1988

TO: S&T/EY, Jim Sullivan

FROM: S&T/EN, Jack Vanderryn

SUBJECT: Private Sector Energy Development PID

Following discussion of this PID at the EN Sector Council meeting on November 16, 1988, the PID is approved, subject to the PP addressing the following issues:

1. The degree to which power generation, distribution, and operation should be the central focus of the proposed project, as compared to other energy activities, needs close examination.

2. The degree of emphasis on U.S. private sector investment versus the indigenous private sector or non-U.S. sources needs further thought (also in light of the current reluctance of U.S. sources to participate in investments in the LDC energy sector). Clearly one of the goals of the project is to help encourage such U.S. investments but we need to assess the likely outcome or success of such AID support.

3. The size and scale of the energy activities which are most amenable to private investment should be examined. Private investment in (>100 Mw) large projects might have the greatest impact; but it is not clear that this is where the bulk of real-world action would actually occur. Smaller scale facilities (e.g., 5 - 20 Mw biomass-fired plants) could be more attractive and easier to bring to fruition as projects. Since we need to have some early successes in the project, it is not now obvious whether the emphasis should be on larger scale activities (where private investment is more difficult to bring to closure) or smaller ones where project commitments are more readily and quickly attained.

4. The relative emphasis in the project on private investment versus other forms of private participation (e.g., operation) needs to be examined.

In summary, the project's overall goal is to encourage private participation in the energy sector. S&T/EY emphasis thus far seems to be on private power projects involving U.S. companies and U.S. financial investment. That is a small fraction of the total universe of the project's goal and our potential for success in this more limited area is not at all clear.

Attachment

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c. Conduct Special Studies .

To promote further private participation in the energy/power sector, additional research and analysis is necessary on a variety of issues. As the PSED Project proceeds, the Office of Energy in coordination with the Core Staff/Expertise Sourcing Contractor will determine what Special Studies are undertaken. The possible special study topics listed below are illustrative, but not inclusive of all of the possible topics.

o Model policies and guidelines for private participation in the energy/power sector.

This study would develop policies and guidelines for implementing private power. Many developing countries have public policies, regulations and practices that actually prohibit or discourage private sector involvement. In many countries only the state-owned utility can generate, distribute and sell electric power. Additional barriers to investment by foreign and domestic private sources, such as restrictive tax policies, high import duties, restrictions on repatriation of profits, prohibitions on foreign ownership of companies, lack of guarantees of payment on contracts and inadequate mechanisms for dispute resolution exist in most of the developing countries. Before private sector participation in the energy sector can occur, a high level policy dialogue must be initiated and basic policy issues must be resolved.

The Study would prepare guidelines for implementing appropriate policies which are necessary for private sector involvement in energy development. Guidelines will also be prepared to assist host governments in soliciting and evaluating proposals, negotiating contracts, settling contract disputes and monitoring contract compliance.

o Analysis of alternative private enterprise participation strategies

The involvement of the private sector can take many approaches, depending on the interests of the national government, its utility authorities, and local and foreign private interests. The approaches for private involvement could include:

-private ownership and operation of discrete components of the system, such as generating plants or transmission and distribution systems;

-private ownership and operation of the entire electric utility system;

-contracting to private businesses to perform certain functions, such as revenue collection or plant operation and maintenance;

-temporary private ownership where the utility authority sells certain assets for later lease-back or buy-back; and

-investment of private funds into publicly held utility systems through debt instruments, loans and bonds.

o Capital markets

Depending upon host country needs, important studies for the PSED Project could be the analysis of characteristics of indigenous capital markets and the extent to which these capital markets can provide financing for subprojects and the extent to which they can support private power generation activities over the long-term. The Office of Energy foresees working closely with the Bureau for Private Enterprise in this area.

o Macro-economic impacts of private power generation

Studies could be conducted, as needed, to assess the impact of private power on the macro-economic situation of developing countries. This could include the effects on Gross National and Domestic Product, balance of payments and trade flows, agricultural and industrial output and employment opportunities in selected developing countries.

o Subproject financing

As needed, finance experts would be retained to analyze possible financing assistance programs, contract guarantees, and possible alternative loan security instruments. Export credit agencies and public and private bank lending programs, such as sovereign guarantees, escrows, and bank letters of credit would also be investigated.

o A.I.D. direct loan or loan guarantee program

A.I.D. recently designed a direct loan program that would be relevant to the PSED Project. The Pakistan Private Sector Energy Development Fund is administered by the National

Development Finance Corporation. The Fund finances private sector subprojects which meet the eligibility criteria and qualify for financing. The terms of the loan include a five year grace period and repayment over twenty years. The on lending interest rate from the Fund to the eligible private sector entities is currently 14% p.a. The repayment terms for on lending are up to twenty-three years including up to eight years' grace period. The Government of Pakistan bears the foreign exchange and interest rate risks.

This type of direct lending and a possible loan guarantee program for the PSED Project would be analyzed.

d. Conferences and Training Workshops in Host Countries

The PSED Project will conduct three (3) in-country Conferences and eight (8) Workshops with government officials, state utility officials and private sector representatives to develop acceptable approaches to private sector participation in the energy/power sector, including information about the experience in the United State with the Public Utility Regulatory Policies Act.

The Conferences, aimed at high level government officials and private sector executives, will address key policy and institutional and corporate financial issues based on findings of the country specific assessments. The Conferences are intended to improve the overall policy and institutional framework for private sector participation in the energy sector.

The Workshops will target middle management and technical personnel in government ministries, state utilities and the private sector. For example, the Workshops will provide guidance in soliciting, evaluating and pricing proposals to produce and sell private power. They will also provide assistance in arranging equitable contracts, securing subproject loans from foreign lenders and integrating private facilities into public power systems.

Examples of successful workshops and seminars of this nature in which A.I.D. has recently participated appear in Annex K.

e. Expertise Sourcing Assistance

The PSED Project will support ten (10) Technical Assistance Teams of private power experts to be dispatched to A.I.D.-assisted countries requesting assistance for private

participation in their energy/power sectors. This assistance could help increase their level of confidence in dealing with private sector power firms, thereby reducing the amount of time spent on the expensive development phase. The short term assignments would be from one week to three months. Long-term energy consultants to host countries could also be provided, if necessary and if resources permit. The PSED Project will develop and maintain as part of the Private Power Data Base a "roster" of technical experts. The consultants would have special expertise and experience in energy utility law and regulation, utility power purchase agreements, international law, negotiating with private power providers, international financing and subproject financing, political and commercial risk insurance, utility engineering, design and construction, and market analysis.

Since experts in the field of private power are generally in high demand and are highly compensated, in preparing the PSED Project Project Paper, a limited, telephone survey was undertaken to determine the availability of these experts at the A.I.D. maximum daily rates. The survey contacted executives from American Electric Power, Inc., Pacific Gas & Electric, Inc., Morgan Stanley, Shearson Lehmen, California Public Utility Commission, Massachusetts Public Utility Commission, utility economics professors and utility lawyers.

The survey asked these questions: (1) Would the person be willing to be a technical expert and travel overseas to a developing country to provide training and or technical assistance for one to two weeks or more? (2) Would they be willing to do so if they were compensated at A.I.D.'s maximum daily rate?

In general, most respondents were willing to consider providing their technical expertise but could not commit without knowing the exact specifics of the travel and technical assistance required. Public utility commission members expressed the most interest with some lesser degree of interest expressed by utility executives and the utility economics professor and lawyers. Needless to say, follow-on business is always desirable, subject to the standard FAR requirements, which will be included in all such technical assistance contracts and will be followed in the consultant selection procedures to insure that there are no organizational conflicts, as defined in the FAR.

Regarding the compensation question, as expected, few of the persons surveyed would provide a definitive answer concerning their willingness to accept A.I.D. daily rates. The utility commissioners and a utility company executive were the most willing to accept the rates. The acceptance of the A.I.D. rate apparently depends on the nature of the assignment, its

relationship to other business opportunities, individual availability and the length of the assignment.

It was generally concluded that a sufficient number of technical experts would be available for the PSED Project Technical Assistance Teams and that the A.I.D. compensation rate would not be a significant obstacle for short term (1-2 week assignments). For longer term assignments and for special individuals, however, it was clear that a waiver from A.I.D.'s compensation rate would be necessary.

f. Training Courses and Internships

The PSED Project will sponsor three formal training courses for senior level policy makers from developing countries. These courses will focus on the opportunities for and impediments to private power development. They will assess the policy and institutional changes needed and generally address technical issues as needed.

Also, the PSED Project will sponsor internships for senior-level and mid-level managers from developing countries. They will have the opportunity for on-the-job-training with U.S. private companies, utilities and utility regulatory commissions.

See also section IV. C. -- Training Plan

g. Regional Energy Representatives

A.I.D. Missions are commonly unable to devote a person full time to energy matters, let alone private power issues. Therefore, the PSED Project proposes to seek funding for at least one energy consultant, to be located in an A.I.D. regional office, to encourage and assist private participation in the energy/power sectors of the countries of that region. Funding will have to be derived from the Bureau, Regional Offices and Missions since the PSED Project lacks sufficient resources.

h. Study Tours

During the PID review, a number of commentors urged the inclusion of Study Tours in the PSED Project. Bringing officials from developing countries to the United States has proven very effective in a number of A.I.D. programs.

Given the dramatic expansion of interest by U.S. companies and utilities in private power and the potential to market U.S. goods and services, the Project now intends to conduct six (6) Study Tours of the facilities and operations of U.S. utilities, private power producers and U.S. public utility commissions for representatives from A.I.D.-assisted countries.

i. The Technical Advisory Group

In order to assist the Core Staff/Expertise Sourcing Contractor, a Technical Advisory Group (TAG) would be established to provide guidance and counsel to the PSED Project. The TAG will be comprised of representatives of government and industry chosen by the contractor with input from the Office of Energy. Examples of possible members include A.I.D. Bureaus and Missions, TDP, Eximbank, OPIC, DOC, DOE and U.S. energy companies.

The TAG will provide a forum for the discussion of the progress of the PSED Project and a review of project policy and direction. The TAG would provide a mechanism for detached review of ideas in a knowledgeable forum to ensure that the project pursues viable options and is abreast of the latest developments of the industry. Also, the TAG will help insure coordination within A.I.D., and with other U.S. agencies and with the energy industry.

j. Supervision of the Private Power Data Base

In order to help coordinate the activities of the PSED Project on a worldwide basis, the Office of Energy proposes to assist in maintaining the Private Power Data Base, established under Energy Conservation Services Program (936-5728). The Data Base contains information concerning country policies, key contracts, subproject opportunities, U.S. suppliers of power equipment and services. The Data Base will be valuable in providing support to the public and private sectors.

Building upon its extensive network in A.I.D.-assisted countries, such activity would be coordinated with the DOC Major Project Tracking System and its Foreign Commercial Service, as well as interagency activities carried out under DOE's Committee on Renewable Energy Commerce and Trade (CORECT).

The Data Base will provide an updated inventory of the following:

- Subproject opportunities by country;

- o U.S. and foreign suppliers of power equipment and services;
- o Key contact persons, firms, agencies and associations in the public and private sectors of developing countries;
- o Current information about laws and regulations on private power; and
- o Information about the economic and trade impacts of specific subprojects, including jobs created, value of exports of goods and services utilized, and estimates of annual income generated.

2. Project Sites

At this time, sites for PSED Project activities have not been determined. It is believed, however, that the activities, especially feasibility and special studies, will be carried out in the early part of this Project in the Philippines, Costa Rica, the Dominican Republic, Indonesia and/or Pakistan. This is due to the high level of interest and cooperation in private sector energy development by these host country governments to date.

3. Project Participants and Responsibilities

a. Office of Energy

The Office of Energy, will assign a Project Officer, who will be responsible for overseeing and providing guidance for the PSED Project. The Office of Energy will provide centralized project supervision and a mechanism for dissemination of project results as needed in the broader A.I.D. policy and programming process. The Office of Energy will coordinate the efforts of the other A.I.D. Bureaus, Missions, the multilateral banks, other government agencies and representatives from private industry, in order to achieve the project's objectives in an efficient manner. The Project Officer in the Office of Energy will be responsible for managing the project and ensuring that A.I.D. objectives are met.

b. Other A.I.D. Bureaus and Missions

The expertise and knowledge of the A.I.D. Bureaus and Missions of the current conditions in host countries will be important to the efficient implementation of energy subprojects.

The A.I.D. Bureaus and Missions would provide information germane to the specific subprojects, such as economic, environmental, cultural and political conditions existing in the host country. They will be invited to assist the PSED Project in activities such as the following:

- o Advise on feasibility studies;
- o Recommend countries needing technical experts;
- o Co-sponsor Country Assessments, Conferences, Workshops, Training and Internships, and Study Tours; and
- o Collaborate on Special Studies and Regional Energy Consultants.

c. Core Staff and Expertise Sourcing Contractor

The Core Staff/Expertise Sourcing Contractor would have overall responsibility for PSED Project management and coordination. The contractor would oversee all activities with direct responsibility for the Technical Advisory Group, some Technical Assistance teams, some workshops, and some Study Tours.

Also, if funding from buy-ins becomes available the contractor would manage Regional Energy Consultants.

d. Feasibility Study Fund Contractor

This contractor will serve as Feasibility Study Fund administrator on a worldwide basis. The contractor will be responsible for several key functions, including the following:

- o Promote the PSED Project and the use of the Feasibility Study Fund throughout the energy industry and A.I.D. worldwide so that qualified parties are aware of the existence of the Fund, its purpose and procedures required to access it;
- o Solicit applications for assistance from the Feasibility Study Fund;
- o Help the Office of Energy review proposals for feasibility studies;
- o As needed, conduct special studies, such as economic, financial, institutional/regulatory and technical analysis to ascertain likelihood of success of subprojects proposed in applications to the Feasibility Study Fund;

- o Assist subproject sponsors and A.I.D. with application to the Feasibility Study Fund, throughout the contracting phase, and later, assist subproject sponsors with A.I.D. administrative problems related to their subprojects; and

- o Provide project monitoring support to help ensure that A.I.D.'s objectives are met by subproject sponsors

For the initial sixteen months of the PSED Project the Feasibility Study Fund will be administered by Bechtel. Bechtel's current contract with S&T/EY has been reviewed by the Agency's Office of General Counsel and Office of Procurement. Both parties concur with this arrangement for the administration of the Feasibility Study Fund in the early stages of the project implementation.

e. Subproject Sponsors

For the purposes of the PSED Project, a "subproject" is a proposed private energy facility, such as a power generation plant. The subproject sponsor will be a U.S. or host country private sector company responsible for project development, financing or implementation. The subproject sponsor would be responsible for prefeasibility and feasibility studies for individual private energy subprojects. The subproject sponsor will be responsible for determining the economic, financial, social and environmental feasibility of a particular power subproject.

Willingness of private firms to buy into the project is based on offers from thirteen firms (Cogentrix, United Engineers, Stone and Webster, United Engineers, Florida Power and Light, Intrag, Bechtel, Morgan Guarantee Bank, Chase Manhattan Bank, Pacific Gas and Electric, U.S.A. Offshore, Hadson Power and Pyropower) and from the research conducted for the Power Shortages in Developing Countries report.

f. Other appropriate U.S. agencies, bilateral donors & multilateral development banks

Other appropriate U.S. agencies, such as OPIC, the Department of Commerce and the Department of Energy, will be invited to participate in this project, either on a subproject by subproject basis or as members of the Technical Advisory Group.

The Department of Commerce sponsors trade missions which promote U.S. exports and posts Foreign Commercial Service

Officers in A.I.D.-assisted countries. They would be a useful instrument for promoting the Private Sector Energy Development Program and would be a forum for attracting U.S. firms to invest in the developing countries.

The Department of Energy has a fund ($750,000) available for use on energy development in the advanced coal technologies area. The DOE also has an experienced technical staff who could assist in the evaluation of subproject proposals.

Since EXIMBANK & OPIC are potential sources of direct loan guarantees or risk insurance for private energy subprojects, they could play major roles in increasing private participation in the energy sector.

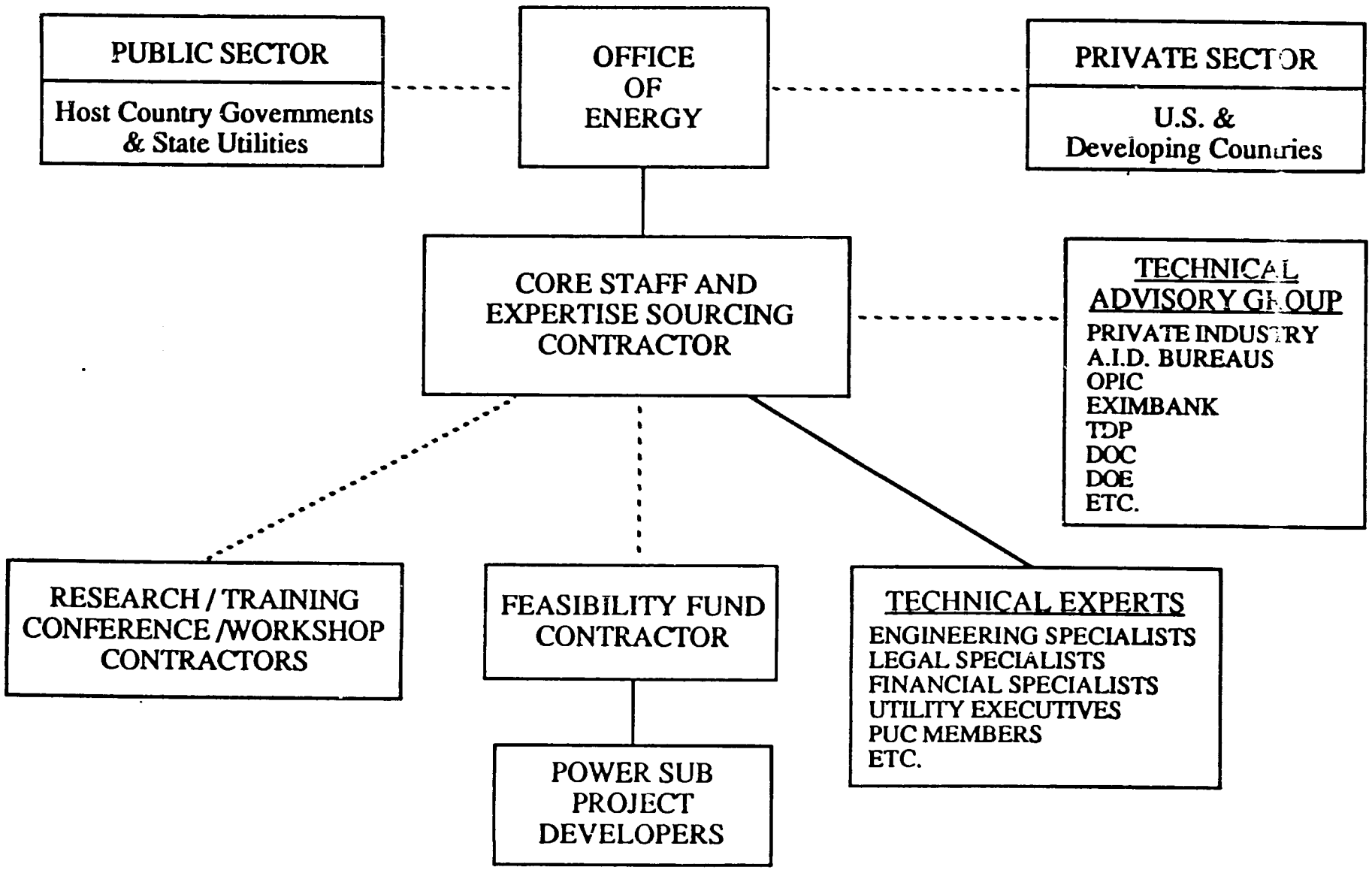
The World Bank, Asian Development Bank, Interamerican Development Bank, the African Development Bank, and International Finance Corporation are multilateral financial institutions that could assist in the financing of energy generating projects. Their precise involvement in the project will depend upon the specific subprojects that are proposed.

Government and State utilities in A.I.D.-assisted countries would be the direct beneficiaries of A.I.D. technical assistance, training and special studies. Their participation would be sought in all project activities throughout the life of the project.

The PSED Project will benefit private industry and energy trade associations through its information dissemination activities and opportunities to provide technical assistance, as well as through its ability to create new subproject opportunities for energy/power equipment supply and service companies. While the PSED Project will not be a funding source for subproject development beyond the feasibility study stage, an objective of the PSED Project is to leverage private capital for investment in the energy/power sector of A.I.D.-assisted countries. To the extent that it is able to do so, the PSED Project will also benefit international and host country capital market groups including securities markets, private banks and private investors.

Exhibit 1

PSED PROJECT ORGANIZATIONAL CHART



III. COST ESTIMATES AND FINANCIAL PLANS

The PSED Project will be funded $15.34 million -- $9.76 million of Office of Energy Funds and an estimated $5.58 million in matching funds from Missions, other A.I.D. Bureaus, other donor agencies, multilateral funding agencies and the private sector. The project will be conducted over a period of six years beginning in 1989, with funding commitments to be completed, except for the Core Staff and Feasibility Study Fund Contractor, in the fifth year, 1993. The following outputs are expected:

- o Six (6) Country Assessments/Strategic Plans of the potential for Private Sector participation.
- o Twenty-five (25) Feasibility Studies
- o Five (5) Special Studies (e.g., Macro-economic impact studies, local capital market requirement studies, and studies on the alternative forms of private sector participation in the energy sector).
- o Three (3) conferences and eight (8) workshops
- o Ten (10) Short-term Technical Assistance Team Missions to Host Countries
- o Three (3) one to two week training courses
- o Twenty (20) internships
- o One (1) Regional Energy Consultant in the field
- o Six (6) Study Tours
- o A Technical Advisory Group
- o Private Power Data Base supervised.

Exhibit 2-i

SUMMARY OF EXPENDITURES FOR PSED PROJECT
FY 1989 - 1994

	Total			
	PSED	Buy Ins	Priv S C/S (1)	Total
EXPENDITURES				
I. Core Staff/Expert. Sourc. Contract				
A. Project Core Staff (2)				
1. Director	$1,445	$0	$0	$1,445
2. Deputy Director	$652	$0	$0	$652
3. Research Assistant 1	$509	$0	$0	$509
4. Secretary 1	$226	$0	$0	$226
5. Secretary 2	$136	$0	$0	$136
Sub-total	$2,968	$0	$0	$2,968
6. Expenses	$1,350	$0	$0	$1,350
Sub-total	$4,318	$0	$0	$4,318
B. Tech. Adv. Grp. Expenses (3)	$450	$0	$0	$450
C. TA Team Expenses (4)	$125	$150	$0	$275
D. Workshops (5)	$125	$0	$0	$125
E. Study Tours (6)	$105	$0	$0	$105
F. Reg. Energy Consultants	$0	$1,000	$0	$1,000
Total	$5,123	$1,150	$0	$6,273
II. Other Existing Contracts and IQC's				
A. Feasibility Studies (7)	$2,000	$825	$2,300	$5,125
B. Feasibility Fund Administration	$1,032	$275	$0	$1,307
C. Country Assessments (8)	$300	$300	$0	$600
D. Special Studies (9)	$200	$50	$0	$250
E. TA Team Expenses (4)	$125	$0	$0	$125
F. Workshops (5)	$125	$150	$0	$275
G. Study Tours (6)	$105	$105	$0	$210
H. Conferences (10)	$250	$125	$0	$375
I. Trng/Internships (11)	$300	$300	$0	$600
Total	$4,437	$2,130	$2,300	$8,867
III. Evaluations	$200	$0	$0	$200
TOTAL EXPENDITURES	$9,760	$3,280	$2,300	$15,340

NOTES:

(1) Private Sector Cost Sharing of feasibility studies.
(2) Salaries are calculated using a multiplier of 2.50. Secretary salary uses multiplier of 1.4
(3) Assumes all staffing expenses provided under Project Core Staff.
Assumes 3 meetings/year at $25,000 per meeting for travel/transportation, per diem, and miscellaneous expenses.
(4) Assumes all coordination and sourcing costs of staff provided under Project Core Staff
Assumes cost of $25,000 per TA Team Trip and 4 trips in each year for travel/transportation, per diem, consulting fees, and miscellaneous expenses.
(5) Assumes 8 workshops will be held over the project period at a cost of $50,000/workshop
(6) Assumes 9 study tours to U.S. at $35,000
(7) Assumes 22 feasibility studies at a cost of $200,000-$300,000 each
(8) Assumes 6 country assessments will be done over the course of the project at a cost of $100,000/assessment.
(9) Five Special Studies include studies macro-economic impact, local capital market requirements, and alternative forms of private sector participation costing $50,000 each.
(10) Assumes 3 conferences in developing countries at $125,000 each
(11) Assumes 3 institutional training courses will be held at approximately $100,000/course and 20 internships at $10,000 each

8a CONTRACT

TECHNICAL ADVISORY GROUP

Category	Year 1	Year 2
2 Meetings in D.C.* $22,500@	45,000	45,000
2 Committee meetings in D.C.** $6,075@	12,150	12,150
Misc. Expenses: mailings, copying, telephones	3,000	4,000
Subtotal	**60,150**	**61,150**

* Assumptions: 20 members: 5 from D.C. area, 5 from East Coast, 5 from West Coast, & 5 from Midwest
Per diem =3 days per meeting = 3 x $125/day = $375@
20 x $375 = **$7,500**
Travel = (10 x $600) + (5 x $1,000) = $11,000
Misc. expenses = **$4,000**

**Assumptions: 5 members: 1 from D.C. area, 1 from East Coast, 2 from West Coast & 1 from Midwest
Per diem = 3 days per mtg. = 3 x $125 - $375@
5 x $375 = **$1,875**
Travel = (2 x $600) + (2 x $1,000) = **$3,200**
Misc. expenses = **$1,000**

8a CONTRACT

EXPERTISE SOURCING
SHORT-TERM TECHNICAL ASSISTANCE TRIPS

Category	Year 1	Year 2
4 Expert Teams/yr.* $22,600/trip	90,400	90,400
Subtotal	**$90,400**	**$90,400**

*Assumptions: Expenses for 1 trip with 2 experts per team
Air fare = $4,000@ x 2 = **$8,000**
Per diem = 14 days/trip x 2 x $100/day = **$2,800**
Salary = $[illegible]/day x 11 days x 2 = **$9,800**
Expenses = **$2,000/trip**
Total = **$22,600/trip**

8a CONTRACT

WORKSHOPS

Category	Year 1	Year 2
2 One Day Wkshps. for Utils. & PP Devels. - 1 East Coast & 1 West Coast*	11,600	11,600
1 Two Day Wkshp in Devel. Count.**	78,500	78,500
Subtotal	**90,100**	**90,100**

*Assumptions: Costs for one workshop
1 outside speaker: fee = $500; airfare = $600; per diem for 2 days = $100 x 2 = $200
Subtotal = **$1,300**
Room rental, A-V equip. rental for 1 day = **$500**
Brochure & mailing = $500
Misc. expenses = **$1,000**
Subcontractor support = **$2,500**
Subtotal = **$5,800**

**Assumptions: Costs for one 2 day workshop
5 outside speakers: fee $1,000@ x 5 =**$5,000**; airfare = $3,000@ x 5= **$15,000**; per diem = $100/day x 7days x 5 = **$3,500**
Subcontractor support = **$35,000**
Brochure preparation & mailing = **$10,000**
In-country logistics = **$10,000**
Subtotal = **$43,500**

8a CONTRACT

STUDY TOURS

Category	Year 1	Year 2
1 tour per year*	33,750	33,750
Subtotal	**33,750**	**33,750**

*Assumptions: Cost per study tour with 5 persons per tour
Air fare = $4,000 x 5 = **$20,000**
Per diem - $125/day x 5 x 14 days = **$8,750**
In-country transportation = **$3,000**
Misc. expenses = **$2,000**
Subtotal: **$33,750**

8a CONTRACT

SPECIAL STUDIES

Category	Year 1	Year 2
Security Issues for Private Power	40,000	
Other studies	20,000	30,000
Subtotal	**60,000**	**30,000**

Exhibit 3-i

OFFICE OF ENERGY
BUREAU OF SCIENCE AND TECHNOLOGY
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT
(936-5738)
DETAILED BUDGET FOR OBLIGATION OF FUNDS
FY 1989 - 1994

	FY 1989				FY 1990				FY 1991				FY 1992			
	PSED	Buy Ins	Priv S C/S (1)	Total	PSED	Buy Ins	Priv S C/S (1)	Total	PSED	Buy Ins	Priv S C/S (1)	Total	PSED	Buy Ins	Priv S C/S (1)	Total
EXPENDITURES																
I. Core Staff/Expert. Sourc. Contract																
A. Project Core Staff (2)																
1. Director	$203	$0	$0	$203	$225	$0	$0	$225	$236	$0	$0	$236	$248	$0	$0	$248
2. Deputy Director	$113	$0	$0	$113	$125	$0	$0	$125	$131	$0	$0	$131	$138	$0	$0	$138
3. Research Assistant 1	$68	$0	$0	$68	$80	$0	$0	$80	$84	$0	$0	$84	$88	$0	$0	$88
4. Secretary 1	$31	$0	$0	$31	$35	$0	$0	$35	$37	$0	$0	$37	$39	$0	$0	$39
5. Secretary 2	$0	$0	$0	$0	$31	$0	$0	$31	$33	$0	$0	$33	$35	$0	$0	$35
Sub-total	$415	$0	$0	$415	$496	$0	$0	$496	$521	$0	$0	$521	$548	$0	$0	$548
6. Expenses	$187	$0	$0	$187	$223	$0	$0	$223	$234	$0	$0	$234	$247	$0	$0	$247
Sub-total	$602	$0	$0	$602	$719	$0	$0	$719	$755	$0	$0	$755	$795	$0	$0	$795
B. Tech. Adv. Grp. Expenses (3)	$75	$0	$0	$75	$75	$0	$0	$75	$75	$0	$0	$75	$75	$0	$0	$75
C. TA Team Expenses (4)	$25	$0	$0	$25	$25	$50	$0	$75	$25	$50	$0	$75	$25	$50	$0	$75
D. Workshops (5)	$25	$0	$0	$25	$25	$0	$0	$25	$25	$0	$0	$25	$25	$0	$0	$25
E. Study Tours (6)	$35	$0	$0	$35	$35	$0	$0	$35	$35	$0	$0	$35	$0	$0	$0	$0
F. Reg. Energy Consultants	$0	$0	$0	$0	$0	$250	$0	$250	$0	$250	$0	$250	$0	$250	$0	$250
Total	$762	$0	$0	$762	$879	$300	$0	$1,179	$915	$300	$0	$1,215	$920	$300	$0	$1,220
II. Other Existing Contracts and IQC's																
A. Feasibility Studies (7)	$500	$0	$400	$900	$500	$150	$500	$1,150	$400	$225	$600	$1,225	$400	$225	$500	$1,125
B. Feasibility Fund Administration	$200	$0	$0	$200	$160	$50	$0	$210	$146	$75	$0	$221	$157	$75	$0	$232
C. Country Assessments (8)	$50	$0	$0	$50	$100	$100	$0	$200	$100	$100	$0	$200	$50	$100	$0	$150
D. Special Studies (9)	$100	$0	$0	$100	$50	$50	$0	$100	$50	$0	$0	$50	$0	$0	$0	$0
E. TA Team Expenses (4)	$25	$0	$0	$25	$25	$0	$0	$25	$25	$0	$0	$25	$25	$0	$0	$25
F. Workshops (5)	$25	$0	$0	$25	$25	$50	$0	$75	$25	$50	$0	$75	$25	$50	$0	$75
G. Study Tours (6)	$35	$0	$0	$35	$35	$35	$0	$70	$35	$35	$0	$70	$0	$35	$0	$35
H. Conferences (10)	$0	$0	$0	$0	$125	$0	$0	$125	$63	$63	$0	$125	$63	$63	$0	$125
I. Trng/Internships (11)	$100	$0	$0	$100	$50	$50	$0	$100	$50	$50	$0	$100	$100	$100	$0	$200
Total	$1,035	$0	$400	$1,435	$1,070	$485	$500	$2,055	$894	$598	$600	$2,091	$820	$648	$500	$1,967
III. Evaluations	$0	$0	$0	$0	$0	$0	$0	$0	$100	$0	$0	$100	$0	$0	$0	$0
TOTAL EXPENDITURES	$1,797	$0	$400	$2,197	$1,949	$785	$500	$3,234	$1,909	$898	$600	$3,406	$1,740	$948	$500	$3,187

Exhibit 3-ii

	FY 1993				FY 1994			
	PSED	Buy Ins	Priv S C/S (1)	Total	PSED	Buy Ins	Priv S C/S (1)	Total
EXPENDITURES								
I. Core Staff/Expert. Sourc. Contract								
A. Project Core Staff (2)								
1. Director	$260	$0	$0	$260	$273	$0	$0	$273
2. Deputy Director	$145	$0	$0	$145	$0	$0	$0	$0
3. Research Assistant 1	$92	$0	$0	$92	$97	$0	$0	$97
4. Secretary 1	$41	$0	$0	$41	$43	$0	$0	$43
5. Secretary 2	$37	$0	$0	$37	$0	$0	$0	$0
Sub-total	$575	$0	$0	$575	$413	$0	$0	$413
6. Expenses	$259	$0	$0	$259	$200	$0	$0	$200
Sub-total	$834	$0	$0	$834	$613	$0	$0	$613
B. Tech. Adv. Grp. Expenses (3)	$75	$0	$0	$75	$75	$0	$0	$75
C. TA Team Expenses (4)	$25	$0	$0	$25	$0	$0	$0	$0
D. Workshops (5)	$25	$0	$0	$25	$0	$0	$0	$0
E. Study Tours (6)	$0	$0	$0	$0	$0	$0	$0	$0
F. Reg. Energy Consultants	$0	$250	$0	$250	$0	$0	$0	$0
Total	$959	$250	$0	$1,209	$688	$0	$0	$688
II. Other Existing Contracts and IQC's								
A. Feasibility Studies (7)	$200	$225	$300	$725	$0	$0	$0	$0
B. Feasibility Fund Administration	$169	$75	$0	$244	$200	$0	$0	$200
C. Country Assessments (8)	$0	$0	$0	$0	$0	$0	$0	$0
D. Special Studies (9)	$0	$0	$0	$0	$0	$0	$0	$0
E. TA Team Expenses (4)	$25	$0	$0	$25	$0	$0	$0	$0
F. Workshops (5)	$25	$0	$0	$25	$0	$0	$0	$0
G. Study Tours (6)	$0	$0	$0	$0	$0	$0	$0	$0
H. Conferences (10)	$0	$0	$0	$0	$0	$0	$0	$0
I. Trng/Internships (11)	$0	$100	$0	$100	$0	$0	$0	$0
Total	$419	$400	$300	$1,119	$200	$0	$0	$200
III. Evaluations	$0	$0	$0	$0	$100	$0	$0	$100
TOTAL EXPENDITURES	$1,378	$650	$300	$2,328	$988	$0	$0	$988

Exhibit 3-iii

PROJECTION OF EXPENDITURES

	PSED	Buy Ins	Priv S C/S (1)	Total
1989	$1,797	$0	$400	$2,197
1990	$1,949	$785	$500	$3,234
1991	$1,909	$898	$600	$3,406
1992	$1,740	$948	$500	$3,187
1993	$1,378	$650	$300	$2,328
1994	$988	$0	$0	$988
Total	$9,760	$3,280	$2,300	$15,340

Exhibit 3-iv

SUMMARY OF EXPENDITURES FOR PSED PROJECT
FY 1989 - 1994

	Total			
	PSED	Buy Ins	Priv S C/S (1)	Total
EXP DITURES				
I. Core Staff/Expert. Sourc. Contract				
A. Project Core Staff (2) (3 Professionals, 2 Secr.)	$2,968	$0	$0	$2,968
B. Core Staff Expenses	$1,350	$0	$0	$1,350
C. Tech. Adv. Grp. Expenses (3)	$450	$0	$0	$450
D. TA Team Expenses (4)	$125	$150	$0	$275
E. Workshops (5)	$125	$0	$0	$125
F. Study Tours (6)	$105	$0	$0	$105
G. Reg. Energy Consultants	$0	$1,000	$0	$1,000
Total	$5,123	$1,150	$0	$6,273
II. Other Existing Contracts and IQC's				
A. Feasibility Studies (7)	$2,000	$825	$2,300	$5,125
B. Feasibility Fund Administration	$1,032	$275	$0	$1,307
C. Country Assessments (8)	$300	$300	$0	$600
D. Special Studies (9)	$200	$50	$0	$250
E. TA Team Expenses (4)	$125	$0	$0	$125
F. Workshops (5)	$125	$150	$0	$275
G. Study Tours (6)	$105	$105	$0	$210
H. Conferences (10)	$250	$125	$0	$375
I. Trng/Internships (11)	$300	$300	$0	$600
Total	$4,437	$2,130	$2,300	$8,867
III.Evaluations	$200	$0	$0	$200
TOTAL EXPENDITURES	$9,760	$3,280	$2,300	$15,340

NOTES:

(1) Private Sector Cost Sharing of feasibility studies.
(2) Salaries are calculated using a multiplier of 2.50. Secretary salary uses multiplier of 1.4
(3) Assumes all staffing expenses provided under Project Core Staff.
Assumes 3 meetings/year at $25,000 per meeting for travel/transportation, per diem, and miscellaneous expenses.
(4) Assumes all coordination and sourcing costs of staff provided under Project Core Staff
Assumes cost of $25,000 per TA Team Trip and 4 trips in each year for travel/transportation, per diem, consulting fees, and miscellaneous expenses.
(5) Assumes 8 workshops will be held over the project period at a cost of $50,000/workshop
(6) Assumes 9 study tours to U.S. at $35,000
(7) Assumes 22 feasibility studies at a cost of $200,000-$300,000 each
(8) Assumes 6 country assessments will be done over the course of the project at a cost of $100,000/assessment.
(9) Five Special Studies include studies macro-economic impact, local capital market requirements, and alternative forms of private sector participation costing $50,000 each.
(10) Assumes 3 conferences in developing countries at $125,000 each
(11) Assumes 3 institutional training courses will be held at approximately $100,000/course and 20 internships at $10,000 each

Exhibit 3-v

OFFICE OF ENERGY
BUREAU OF SCIENCE AND TECHNOLOGY
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT
(936-5738)
DETAILED BUDGET FOR OBLIGATION OF FUNDS
FY 1989 - 1994

	FY 1989				FY 1990				FY 1991				FY 1992			
	PSED	Buy Ins	Priv S C/S (1)	Total	PSED	Buy Ins	Priv S C/S (1)	Total	PSED	Buy Ins	Priv S C/S (1)	Total	PSED	Buy Ins	Priv S C/S (1)	Total
EXPENDITURES																
I. Core Staff/Expert. Sourc. Contract																
A. Project Core Staff (2) (3 Professionals, 2 Secr.)	$415	$0	$0	$415	$496	$0	$0	$496	$521	$0	$0	$521	$548	$0	$0	$548
B. Core Staff Expenses	$187	$0	$0	$187	$223	$0	$0	$223	$234	$0	$0	$234	$247	$0	$0	$247
C. Tech. Adv. Grp. Expenses (3)	$75	$0	$0	$75	$75	$0	$0	$75	$75	$0	$0	$75	$75	$0	$0	$75
D. TA Team Expenses (4)	$25	$0	$0	$25	$25	$50	$0	$75	$25	$50	$0	$75	$25	$50	$0	$75
E. Workshops (5)	$25	$0	$0	$25	$25	$0	$0	$25	$25	$0	$0	$25	$25	$0	$0	$25
F. Study Tours (6)	$35	$0	$0	$35	$35	$0	$0	$35	$35	$0	$0	$35	$0	$0	$0	$0
G. Reg. Energy Consultants	$0	$0	$0	$0	$0	$250	$0	$250	$0	$250	$0	$250	$0	$250	$0	$250
Total	$762	$0	$0	$762	$879	$300	$0	$1,179	$915	$300	$0	$1,215	$920	$300	$0	$1,220
II. Other Existing Contracts and IQC's																
A. Feasibility Studies (7)	$500	$0	$400	$900	$500	$150	$500	$1,150	$400	$225	$600	$1,225	$400	$225	$500	$1,125
B. Feasibility Fund Administration	$200	$0	$0	$200	$160	$50	$0	$210	$146	$75	$0	$221	$157	$75	$0	$232
C. Country Assessments (8)	$50	$0	$0	$50	$100	$100	$0	$200	$100	$100	$0	$200	$50	$100	$0	$150
D. Special Studies (9)	$100	$0	$0	$100	$50	$50	$0	$100	$50	$0	$0	$50	$0	$0	$0	$0
E. TA Team Expenses (4)	$25	$0	$0	$25	$25	$0	$0	$25	$25	$0	$0	$25	$25	$0	$0	$25
F. Workshops (5)	$25	$0	$0	$25	$25	$50	$0	$75	$25	$50	$0	$75	$25	$50	$0	$75
G. Study Tours (6)	$35	$0	$0	$35	$35	$35	$0	$70	$35	$35	$0	$70	$0	$35	$0	$35
H. Conferences (10)	$0	$0	$0	$0	$125	$0	$0	$125	$63	$63	$0	$125	$63	$63	$0	$125
I. Trng/Internships (11)	$100	$0	$0	$100	$50	$50	$0	$100	$50	$50	$0	$100	$100	$100	$0	$200
Total	$1,035	$0	$400	$1,435	$1,070	$485	$500	$2,055	$894	$598	$600	$2,091	$820	$548	$500	$1,967
III. Evaluations	$0	$0	$0	$0	$0	$0	$0	$0	$100	$0	$0	$100	$0	$0	$0	$0
TOTAL EXPENDITURES	$1,797	$0	$400	$2,197	$1,949	$785	$500	$3,234	$1,909	$898	$600	$3,406	$1,740	$948	$500	$3,187

Exhibit 3-vi

	FY 1993				FY 1994			
	PSED	Buy Ins	Priv S C/S (1)	Total	PSED	Buy Ins	Priv S C/S (1)	Total
EXPENDITURES								
I. Core Staff/Expert. Sourc. Contract								
A. Project Core Staff (2) (3 Professionals, 2 Secr.)	$575	$0	$0	$575	$413	$0	$0	$413
B. Core Staff Expenses	$259	$0	$0	$259	$200	$0	$0	$200
C. Tech. Adv. Grp. Expenses (3)	$75	$0	$0	$75	$75	$0	$0	$75
D. TA Team Expenses (4)	$25	$0	$0	$25	$0	$0	$0	$0
E. Workshops (5)	$25	$0	$0	$25	$0	$0	$0	$0
F. Study Tours (6)	$0	$0	$0	$0	$0	$0	$0	$0
G. Reg. Energy Consultants	$0	$250	$0	$250	$0	$0	$0	$0
Total	$959	$250	$0	$1,209	$688	$0	$0	$688
II. Other Existing Contracts and IQC's								
A. Feasibility Studies (7)	$200	$225	$300	$725	$0	$0	$0	$0
B. Feasibility Fund Administration	$169	$75	$0	$244	$200	$0	$0	$200
C. Country Assessments (8)	$0	$0	$0	$0	$0	$0	$0	$0
D. Special Studies (9)	$0	$0	$0	$0	$0	$0	$0	$0
E. TA Team Expenses (4)	$25	$0	$0	$25	$0	$0	$0	$0
F. Workshops (5)	$25	$0	$0	$25	$0	$0	$0	$0
G. Study Tours (6)	$0	$0	$0	$0	$0	$0	$0	$0
H. Conferences (10)	$0	$0	$0	$0	$0	$0	$0	$0
I. Trng/Internships (11)	$0	$100	$0	$100	$0	$0	$0	$0
Total	$419	$400	$300	$1,119	$200	$0	$0	$200
III. Evaluations	$0	$0	$0	$0	$100	$0	$0	$100
TOTAL EXPENDITURES	$1,378	$650	$300	$2,328	$988	$0	$0	$988

The PSED Project Budget appears in Exhibit 2. The activities of PSED Project in a specific country will depend on the particular in-country conditions and how they evolve over time. Since the type of private power activities that the PSED Project will undertake in a particular country cannot be known, a certain degree of flexibility between funding levels for different activities is required.

IV. IMPLEMENTATION PLAN

A. Description of Responsibilities of Participants

The PSED Project will be administered by a Project Officer in the Office of Energy who will be directly accountable to the Director of the Office of Energy.

Core Staff/Expertise Sourcing Contractor

The PSED Project will operate primarily through two new contractors; the Core Staff/Expertise Sourcing Contractor and the Feasibility Study Fund Contractor

The Core Staff/Expertise Sourcing Contractor will be responsible for overall coordination and marketing of the PSED Project and will assist the Office of Energy in its project management responsibilities and in obtaining A.I.D.buy-ins and matching funds from private sources. This contractor will retain a core project staff; supervise the Private Power Data Base and the "Private Power Reporter"; organize and lead the Study Tours for energy officials from developing countries; organize and supervise the workshops for representatives of U.S. energy industry and developing countries; organize and staff the Technical Advisory Group; organize and as appropriate, lead the Technical Assistance Team trips to developing countries; organize and supervise training (which will continue to be funded through the Energy Training Project); assist the Office of Energy and the Feasibility Study Fund Contractor with designing, marketing and implementing the Feasibility Study Fund; assist the Office of Energy, as needed, with other feasibility studies funded through other projects in the Office of Energy; assist the Office of Energy in designing and implementing the Conferences; assist the Office of Energy in supervising the Special Studies; and assist the Office of Energy in supervising the Country Assessments. The Core Staff/Expertise Sourcing Contractor will also be responsible for coordinating PSED Project activities, under the direction of the A.I.D. Project Officer, with other activities within the Office of Energy and other A.I.D. Bureaus and Missions.

To advise the Core Staff/Expertise Sourcing Contractor on matters relevant to private sector energy development, the contractor will form a Technical Advisory Group (TAG). The TAG may be comprised of the Project Officer, Project Director of each of the two contractors, A.I.D. Bureau and Mission representatives as appropriate, a representative from DOE, DOC, TDF, OPIC, EXIMBANK and representatives from the private sector energy industry, particularly the power industry.

The full TAG will meet twice a year to review the overall progress and direction of the PSED Project, and provide a forum to discuss trends and developments in the field as they relate to the PSED Project. The TAG will also have an opportunity to review the most recent proposals for use of the Feasibility Study Fund and provide input on the viability of the proposals. The TAG will guard against the PSED Project becoming insular or non-responsive to external forces.

Feasibility Study Fund Contractor

It will be the responsibility of the Feasibility Study Fund Contractor to coordinate the activities associated with the Feasibility Study Fund worldwide. The Feasibility Study Fund contractor will capitalize the Feasibility Study Fund; conduct an annual solicitation for subproject sponsors ("assistance recipients"); prepare a "Standard Form Agreement," which will be developed in consultation with the Office of Procurement and the Office of the General Counsel, for execution by the recipient. (This Standard Form Agreement will include appropriate clauses to reserve rights to the U.S. Government similar to conditions for direct A.I.D. grants, such as rights of access to examine recipient records); advise A.I.D. on which should be approved; and distribute and account for funds to the recipients and administer the repayment of funds from successful subprojects. Monies expended by the Feasibility Study Fund on successful sub-projects would be repaid to the U.S. Treasury unless other arrangements are approved.

For the initial sixteen months of the PSED Project the Feasibility Study Fund will be administered by Bechtel, as long as the activity falls within the scope of the existing Bechtel contract with A.I.D., which determination will be made by the Office of Procurement. The Office of General Counsel and the Office of Procurement agree with the concept of this arrangement for the administration of the Feasibility Study Fund. Nevertheless, final approval of the arrangement by the Office of Procurement will be necessary for project implementation.

For the follow on operation of the Feasibility Study Fund both a cooperative agreement, with its known limitations, and a

straight contract are being considered. The Office of Energy, in consultation with the Office of Procurement, will make the decision of what procurement method is most appropriate.

A cooperative agreement might be an appropriate procurement vehicle where A.I.D. could support an eligible organization doing work in this subject area. It is envisioned that upon termination of A.I.D. assistance this activity would be sustained by contributions from private and other non-A.I.D. sources of funding. Concurrence on the future administration arrangements for the Feasibility Study Fund will be obtained from both Office of General Counsel and the Agency's Office of Procurement.

The Feasibility Study Fund Contractor will work closely with the Core Staff/Expertise Sourcing Contractor to evaluate proposals submitted to the Feasibility Study Fund, assist in expediting administrative details related to use of the Feasibility Study Fund, and disseminate information with respect to the use of the Feasibility Study Fund and progress and findings of the PSED Project. The Feasibility Study Fund Contractor must demonstrate organizational, managerial and administrative support ability to manage a project of this magnitude.

The Feasibility Study Fund will be modeled after the experience of the Trade and the Development Program. Funds will be made available to subproject sponsors through application to the Feasibility Study Fund Contractor under this project. Funds will be disbursed to conduct prefeasibility, feasibility and other project assistance activities to determine the technical, commercial, and financial feasibility of the subproject described in the applicant's study proposal.

The Feasibility Study Fund Contractor will make an annual announcement in the Commerce Business Daily and other appropriate journals of the availability of funds and a request for applications. The announcement will contain the following:

- Description of the Feasibility Study Fund and its purpose.
- Priority areas of interest for funding subprojects.
- Proposal selection criteria.
- Proposal evaluation and review procedures.
- Schedule for submitting applications.

The selection of assistance recipients will be made by judging them against the criteria, similar to the traditional A.I.D. grant selection approach, (not against one another) on a first-come, first-served basis until the funds are totally committed each year.

A full list of selection criteria will be drawn up by the Feasibility Study Fund Administrator for the approval of the Office of Energy. At a minimum, applicants must possess sufficient financial resources and/or the business experience necessary to attract the financing and management that implementation of the subproject would require.

Other Contractors

As needed, the PSED Project will buy into existing Office of Energy contractors and IQC's to undertake the Country Assessments, Special Studies, Conferences, Workshops, Study Tours, Training and some Technical Assistance Team Activities.

B. Procurement Plan

1. Number of Procurements

PSED will require the following procurement mechanisms:

a. New Core Staff/Expertise Sourcing Contractor

b. For the first year, buy-ins to existing Office of Energy Contracts for the Feasibility Study Fund, training and other activities.

c. For subsequent years, the Office of Energy will indentify organizations appropriate to administer the Feasibility Study Fund. Such organizations may include consulting firms, non-profit trade associations, energy technology research and development firms or consortium of the above.

2. Options on contracting arrangements & procedures

During the PSED Project design process, the Office of Energy determined that a need for flexibility in accessing contracted services existed in order to conduct the diverse types of Project activities envisioned under PSED. Thus, several contracting mechanisms, such as individually bid contracts, PASAs or RSSAs, cooperative agreements with leading U.S. research centers, and competitive procurements, Section 8 (a) contracts, non-competitive cooperative agreements, and existing contracts and IQCs were considered.

After careful review of the contracting mechanisms available to the PSED Project, the Office of Energy has decided on the following procurement and implementation strategy:

a. For the Core Staff/Expertise Sourcing contract, for the first two years, the Office of Energy will contract with an 8(a) firm specializing in project management, energy and /or financing, with options to extend for the life of the project. This contractor would provide core staff, project management, identification of technical expertise in energy generation and related fields; and coordinate with associations, private companies and government agencies. This contractor will also have responsibility for the Technical Advisory Group, five (5) Technical Assistance Teams, three (3) Workshops, and three (3) study tours.

b. For the first year, the Office of Energy will execute buy-ins into its existing contractors for the Country Assessments, the Feasibility Study Fund, Special Studies, Training Courses and Internships, Conferences, and some of the Technical Assistance Teams, Workshops and Study Tours as needed. This approach is proposed due to the high level of experience of the existing contractors in these areas.

c. For subsequent years, the Office of Energy will evaluate appropriate methods to administer the Feasibility Study Fund,in consultation with the Office of Procurement. Such organizations may include consulting firms, non-profit trade associations, energy technology research and development firms or consortium of the above.

d. The training activities will initially be conducted through the current Office of Energy contract through buy-ins to its Energy Training Project.

e. The Private Power Data Base and certain Special Studies, Conferences, Workshops, and Technical Assistance would be conducted through the current Office of Energy contracts through buy-ins to its Conventional Energy Technical Assistance Project and the Energy Policy Development and Conservation Project.

f. Any PSED Project needs not met through the two procurements described above will be met through buy-ins into existing Office of Energy contractors and IQC's.

g. The above arrangements will be re-examined after the first year of the Project's operation.

3. Waivers

Although no waivers are requested at this time, as part of the procurement process, it may be necessary to waive the A.I.D. maximum daily consultant rates since many of the special experts needed to ensure the Project's success must come from the private sector and cannot be obtained at current A.I.D. daily rates. These experts include U.S. utility executives, Public Utility Commissions members, private power and energy specialists, investment bankers, attorneys and economists specializing in power generation and/or utilities.

There are two methods available for compensating specialists at a rate higher than the FS-1 cap rate during the PSED Project:

a. For each individual consultant retained a waiver can be obtained from the Agency Director of the Directorate for Energy and Natural Resources in the Bureau for Science and Technology on a case by case basis.

b. In new contracts and amendments the contracting firm can attempt to negotiate a higher rate than the government cap for certain classes of experts with certain levels of experience and training. This would be done during initial procurements.

4. General Logistics and Responsibilities

The Core Staff/Expertise Sourcing Contractor will provide the PSED Project's core staff and overall project management and will identify and field technical long- and short-term experts on an as-needed basis.

The contractor will also conduct workshops, study tours, and manage Regional Energy Consultants (to be funded by buy-ins). The contractor will also oversee Country Assessments, Special Studies, the coordination of Feasibility Study Fund activities, Conferences, Training, Internships, and other PSED Project activities as directed by the Office of Energy.

Please see Exhibit 1 for a chart showing the general organization of the PSED Project.

5. Feasibility Study Fund

The Feasibility Study Fund Contractor in coordination with the PSED Project Director, will be responsible for establishing, marketing and administering the Feasibility Study Fund and assisting the Office of Energy in obtaining buy-ins from A.I.D. Bureaus and Missions and matching funds from private sources.

6. Legal Considerations

With respect to the implementation of the PSED Project, two sets of legal considerations must be taken into account, those of the Host Countries and those of the United States. Legal considerations of host countries will be evaluated on a case by case basis. In the United States, the PSED Project must take into account the ownership and public accessibility of feasibility studies funded, at least partially, with federal monies.

a. The Freedom of Information Act

Under the Freedom of Information Act and Amendments of 1974, all Federally funded information must be available for disclosure to the public. In several situations information can be exempt from the disclosure requirements. As FOIA pertains to the PSED program, the following exception would apply: Trade secrets and commercial or financial information obtained from a person and privileged or confidential information is exempt from disclosure.

Commercial or financial information is considered "confidential" if disclosure of such information is likely to cause substantial harm to the competitive position of the person/firm from whom the information was obtained. This rule also protects the government's ability to obtain necessary information in the future. In several cases of U.S. law, information provided by a private firm or person has been considered exempt from disclosure.

According to the General Counsel's office at A.I.D., all general information found in a prefeasibility study would be available for disclosure. However, specific financial or commercial information of the contractor who conducted the study would not be disclosed.

b. Rights & Data Issues

A major component of the PSED Project will be to fund prefeasibility and feasibility studies for energy sector

development in A.I.D.-assisted countries. In cases where the U.S. government funds a study, the question arises as to who owns the information in the study's final report. Does the contracted firm own the information in the report because it performed the study? Or does the information belong to the Government because it funded the study? The answer is two-fold. The government does have access to the information in the study. However, the firm has proprietary rights to the information in the study. (F.A.R. 52.227-14).

In general, the Government honors the rights in data resulting from private developments, and limits its demands for such rights to those essential for Government purposes. In cases where completion of the contract results in an invention, the contractor is normally granted a revocable, nonexclusive, royalty-free license to that invention throughout the world. In contracts that involve cosponsored, cost sharing, or joint venture research and development, and the contractor, cosponsor or joint venturer is making a substantial contribution of funds, facilities, or equipment to the work performed under the contract, there can be a modification, waiver, or omission of rights of the Government.

In order to carry out their missions and programs, it is necessary for the departments and agencies to acquire or obtain access to many kinds of data produced during or used in the performance of their contracts. Agencies require such data to obtain competition among suppliers; fulfill certain responsibilities for disseminating and publishing the results of their activities; ensure appropriate utilization of the results of research, development, and demonstration activities including the dissemination of technical information to foster subsequent technological developments; and meet other programmatic and statutory requirements.

At the same time, the Government recognizes that its contractors may have a legitimate proprietary interest (e.g., a property right or other valid economic interest) in data resulting from private investment. Protection of such data from unauthorized use and disclosure is necessary in order to prevent the compromise of such property right or economic interest, avoid jeopardizing the contractor's commercial position, and preclude impairment of the Government's ability to obtain access to or use of such data. The protection of such data by the Government is also necessary to encourage qualified contractors to participate in Government programs and apply innovative concepts to such programs. Under these conditions, subcontractors will be able to argue the propriety of prefeasibility and feasibility studies resulting from the PSED Project.

C. Training Plan

Training will be provided in the U.S. and in the host countries in the following two categories:

1. Private Power Executive Seminar Course

The Private Power Executive Seminar will be aimed at government officials responsible for establishing policies for the electricity sector. The seminars would be for ministers and executive-level policy makers selected by and representing the ministries. For example, each participating country could invite a team to attend including the Minister of Finance, Energy, Natural Resources, and the Director of the National Utility.

The PSED Project will fund three (3) one-two week seminar courses.

2. Internships with U.S. Industries and Utilities

Individuals could be provided on-the-job training (OJT) in U.S. private and public sector companies and utilities having extensive experience with independent power generation in the U.S. These organizations would be contacted to determine their interest in participating in the PSED training program.

Individuals could also be placed with U.S. public entities involved in Public Utility Regulatory Policy Act (PURPA) and independent power production implementation such as state Public Utility Commissions (PUC's) and the Federal Energy Regulatory Commission (FERC). Since regulatory institutions are not normally training organizations, special arrangements will have to be made on a case by case basis.

This program would provide hands-on, practical experience with new power technologies and the complex financial, economic and regulatory issues associated with independent power producers. The PSED would fund twenty (20) internships.

D. Evaluation Plan

1. FY 1991 Evaluation

The FY 1991 evaluation will examine the validity of PSED Project assumptions and make recommendations for PSED Project continuation. The following will be examined:

a. The extent and commitment of host countries' interest in pursuing private power in their national systems as evidenced by a willingness to examine objectively the state of their power facilities, a willingness to allow U.S. power firms to conduct prefeasibility or feasibility studies in their countries, and a receptiveness to policy dialogue.

b. The interest and capability of the U.S. and host country private sector to propose viable subprojects as evidenced by the number of proposals for use of the Feasibility Study Fund.

c. The performance of the Feasibility Study Fund and the effectiveness of the private sector in conducting prefeasibility and feasibility activities in the area of private power generation. This evaluation will come at an important juncture in the PSED Project since by this time the PSED Project institutions should be fully operational, five to seven study requests should have completed the process of general tender, proposal submissions, evaluations, and study start-up, and several feasibility studies should be underway, with at least two completed.

Also, a redesign of the monitoring plan for years (1992-1994) will be completed.

4. Final PSED Project Evaluation (FY 1994)

This review will focus on the effectiveness of the Feasibility Study Fund as a catalyst for private power subproject implementation and the integrity of the Feasibility Study Fund's study portfolio.

E. Monitoring Plan

A.I.D. must balance the need for progress with the A.I.D. required levels of reviews and approvals, assuring itself that the PSED Project is moving as planned while not requesting unnecessary information that could further slow what could easily become a cumbersome process. A key ingredient for success will be the speedy appraisal of private sector proposals by the Feasibility Study Fund Contractor to allow approval of disbursements from the Feasibility Study Fund. These reviews must be fair, thorough and in the best interests of the PSED Project's goals and purposes

Selection of fund recipients will be made based on selection criteria developed by the Feasibility Study Fund Contractor with the Office of Energy. The Project Officer from the Office of Energy will need to monitor these reviews to ensure that this is the case. This monitoring plan covers only the first two years of the PSED Project. Recommendations for a monitoring plan for subsequent years will be an output of the first formal PSED Project evaluation.

1. Monitoring Objectives

Ultimately it will be possible to monitor the PSED Project by measuring contributions to the PSED Project goal, e.g., how much additional electricity has been generated. In the first two years, however, it will be more appropriate to measure achievement of the PSED Project purpose, e.g., the extent to which private sector technical and managerial resources have been mobilized to meet energy investment needs.

This early monitoring will best be accomplished by a planned review of progress towards the achievement of specific outputs as well as the timely and adequate supply of inputs.

a. Input Monitoring

The Office of Energy will monitor: (1) timely provision of long and short-term technical assistance by the contractor; (2) timely establishment of the Technical Advisory Group; (3) timely procurement of appropriate commodities; (4) timely provision of inputs by other donors (if any, contributions to the Feasibility Study Fund and financing of required technical assistance); and (5) the timely provision of A.I.D. Bureaus and Missions contributions to the PSED Project.

b. Output Monitoring

The Office of Energy will monitor: (1) the number and quality of proposals received; (2) the number and quality of Feasibility Study Fund use reviews carried out by the contractor; (3) progress of on-going private sector power proposals; (4) drawdown of the Feasibility Study Fund by subproject sponsors; (5) the number and quality of policy and other studies being conducted; and (6) the number and quality of requests for proposals or other tenders issued by host governments for private sector proposals.

2. Monitoring Methods

a. Persons Responsible

The Office of Energy proposes to delegate much of the day-to-day implementation responsibilities to the Core Staff contractor and to the Feasibility Study Fund contractor. These contractor will provide information needed by the Office of Energy to effectively monitor progress. They will report to the Project Officer, who will be a member of the Office of Energy staff. The Project Officer will report to the Director of the Office of Energy. The Project Officer will be responsible for ensuring effective monitoring of the PSED Project. An illustrative monitoring schedule is presented in Section C below; this will undoubtedly be amended several times to take into account the exigencies of the PSED Project as it unfolds.

b. Data Gathering

The Project Officer will acquire data needed to monitor the PSED Project from a number of sources. Some of these sources would include:

- o Daily/weekly meetings with the Core Staff Project Director
- o Monthly/Quarterly reports from the Core Staff Project Director
- o Semi- annual meetings with the Technical Advisory Group,
- o As-needed visits to key host country officials, usually accompanied by the Project Director,
- o Site visits to potential plant sites,
- o Meetings with potential power investors, foreign and domestic,
- o Meetings with other donor counterparts,
- o Field visits to evaluate the technical and financial claims of potential users of the PSED Project Assistance Feasibility Study Fund. This tool should be used only for spot checks, since monitoring of proposal claims will be the responsibility of the contractors.

o Semi-annual Project Implementation Reviews for participating USAIDs (for which the Missions' PROMIS and ISS computer assisted monitoring systems will be used).

c. Illustrative Monitoring Schedule

A possible schedule of activities for monitoring progress towards provision of inputs and achievement of outputs is provided below. It describes the activities to be undertaken by the Project Officer, reporting to the Director of the Office of Energy.

Activity	Frequency	1. Inputs/2. Outputs Monitored
Meetings with Proj. Director	As needed, at least weekly	1. Provision of tech. asst. & commodities; Assessment of quality of TA staffing. Early identification of constraints. 2. Overview of progress on all outputs.
Meetings of Tech Advisory Group (TAG)	Semi-annually	1. Overview of constraints to speedy input delivery; detailed discussion of solutions. 2. Analysis of quality and quantity of outputs by relevant institutions.

Visits to host country officials	As needed, irregularly	Personal confirmation of information; assessment of quality of TA
Visits to potential sites to be studied	As needed, infrequently	Spot checking of viability of fund use.
Meetings with Private Sector	As needed, and/or requested by Priv. Sector	Assessment of level of comfort/confidence of potential and actual proposers. Identification of bottlenecks and potential problems.
Meetings of donor counterparts and use of these	As needed, at least semi-	Review of resources available to the Feasibility Study Fund
	annually in first two years	resources; mutual assessment of progress towards outputs; identification of policy issues; and coordinated responses to policy issues.

3. Future Refinements

The purpose of a monitoring plan is to identify and quantify the actions and sites of Project activities is required and to deploy available staff, in a rational and systematic manner. If successful, the result will be good management of the PSED Project leading to expedient implementation of PSED Project elements.

Currently, it is not possible to identify or quantify most actions and sites for subprojects, because investors have yet to be identified. Therefore, this monitoring plan is not complete. As subprojects are identified, the requirements for monitoring (frequency, scope, and personnel available) will also be identified.

F. Summary of Analyses

1. Technical Analysis

Electrical energy has traditionally played a key role in the agricultural, industrial, and social development of a county. In general, about 50 percent of the electricity production in developing countries is used by industry and the remainder is consumed in the agricultural, commercial, and residential sections.

During the 1980-1985 period, the demand for electricity in most developing countries out-paced the general growth in energy consumption and increased by 7% per year. This high growth rate was, in part, due to energy intensive industrial uses coupled with urban development which increased the residential power consumption.

Furthermore, many of these countries embarked on extensive rural electrification programs in an effort to promote rural development and control population shifts towards the urban sections. These forces will likely continue to influence the demand for electricity for the foreseeable future. Consequently, while the average GDP is expected to grow at 3-4% through the year 2000, the demand for electrical energy will likely increase by 4-5% in the developing countries.

Most developing countries are experiencing severe power shortages that hamper their development plans and economic activities. Among Asian countries, for example, the Philippines has a power shortage of about 8 percent of demand, Pakistan over 25 percent, Bangladesh about 20 percent, and India 15 percent.

The industrial sector in developing countries has been especially affected by power shortages. In some countries, industry receives only 20 percent of it power needs during the peak demand season. The loss of production because of power cuts, estimated at over one order of magnitude higher than the actual cost of power, has considerably slowed industrial growth in these countries. In many regions of developing countries, industrial expansion is delayed because new factories cannot obtain a tie-in to the grid. To reduce the impact of power shortages, private companies are installing small, inefficient diesel generators that use expensive imported fuels. Such a practice only increases the country's dependence on imported petroleum products.

To alleviate the power shortage problem, national utilities in developing countries can adopt energy efficiency and conservation strategies. Modernization of the existing power system can increase the available generating capacity by 8 - 10%. Studies in developing countries suggest that conservation projects using existing technologies can save an estimated 10 to 30% of the energy consumed in the industrial sector. Use of alternative sources of energy such as geothermal, hydropower, wind, solar, and biomass as well as leading new technologies including cogeneration and fluidized bed combustion can also reduce the severity of the power shortages in developing countries.

Private participation in the power sector is a viable approach for alleviating power shortages and for reducing the financial burden of power sector expansion. The private sector can improve efficiency in the power sector by introducing competitiveness through the force of the market economy. The private sector is able to attract a higher quality of technical, managerial and financial personnel than the national utilities which are often constrained by the low wages they offer. The private sector can also inject additional financing into the power sector, a sector which currently consumes 60% of the development budget in many A.I.D.-assisted countries. Finally, the private sector can take the initiative in adopting innovative power technologies that the national utilities consider to be outside of their traditional scope.

Private participation in the power sector may take the form of complete privatization, in which the power systems are transferred from public to private ownership. Alternatively, the private sector can perform certain functions such as plant operation and maintenance as a private contractor to the public utility. The private sector may also assume temporary ownership of certain utility components under a lease-back or buy-back arrangement. The private sector can also provide much needed technical and managerial expertise to the public utilities in such areas as system planning, technology and fuel evaluation, project solicitation and review systems, plant engineering, systems maintenance, and environmental control.

The private sector can provide additional electric generating capacity through the implementation of private power projects on a Build-Own-Transfer basis, in which a private power company constructs a power facility, operates it and sells power to the public utility over a period of time, after which time the ownership of the facility is transferred to the public utility. Another private power project development arrangement is the Build-Own-Operate. This arrangement is similar to BOT, but differs in that the ownership of the generating facility is not transferred to the public utility. Finally, private companies can self-generate electricity and export excess power to the utility on a contract basis.

Although private participation in the power sector represents a significant opportunity to reduce the effects of the power shortages in developing countries, private investment in these countries still remains hampered by a number of barriers including public policies, regulations, and practices in that prohibit private sector involvement.

2. Financial Analysis Summary

The purpose of financial analysis for the Private Sector Energy Development Project is to determine the value of the project as a self contained entity. Financial analysis is only concerned with determining whether the directly quantifiable monetary benefits from the project are larger or smaller than the project's costs. The broader analysis of indirect, opportunity, and social costs is undertaken in the economic analysis.

Financial analysis for the Private Sector Energy Development Project was conducted for three purposes:

1. To assess the financial returns to A.I.D. resulting from its support in this project.

2. To assess the financial returns and incentives for the private firms who will perform the feasibility studies and other special studies.

3. To assess the expected financial returns to the private power project facilities that will ultimately be operated as a result of this development project.

A.I.D. Financial Analysis

As is common in any foreign aid program that seeks to transfer resources to developing countries, the financial returns to A.I.D. for its participation in the Private Sector Energy Development Project are not expected to cover the costs of the program. In terms of project costs, A.I.D. and other sources agencies will provide an estimated $15.4 million in funding for the PSED Project. In terms of project revenues, financial returns for this investment are very limited. The repayment of feasibility study funds by successful private sector participants are the only expected project revenues, estimated at $1 million or less.

Feasibility Study Fund Financial Analysis

If the PSED Feasibility Study Fund generates 5 successfully constructed subprojects each year with a profit (in present value terms) of $5 million each, then the overall value of the PSED Project would be an estimated $20.125 million. (This assumes that firms spend $25,000 for each proposed study or prefeasibility study.) Note that under the assumptions of Table 2, each of the five successful utility plants needs to have a lifetime present value profit of only $1,375,000 to cover the initial costs of the PSED fund.

Private Power Facility Financial Analysis

The bottom line as to whether the PSED Project is financially viable and successful, either for A.I.D. or the private sector firms, depends on the operating viability of the private power facilities constructed as a result of the Project. Electric utilities in developing countries tend to be state controlled and inefficient. Most do not generate enough revenue to cover their operating and capital investment expenses. The poor financial state of many electric utilities in developing countries is due to several factors, including:

1. Electricity rate ceilings that set the marginal revenue from an additional kWh below its marginal cost of supply,

2. Bureaucratic management, where employee-to-customer ratios are much higher than private sector plants due in part to political pressures to hire,

3. Inefficiencies in the areas of technology used in production methods and delivery.

While private sector profit incentives should be able to correct the last two problems, more economic pricing policies (that allow revenues to cover costs) are required to make operating such utilities financially viable for private sector firms. In the interim period, cross-subsidies to the private sector facility operator may allow a government to slowly adjust its electricity pricing tariffs.

3. Economic Analysis

The purpose of economic analysis for the Private Sector Energy Development Project is to determine whether the Project will be a worthwhile investment for the affected countries. The analysis estimates whether the outputs from the Project are sufficiently valuable so as to cover the Project costs. Economic analysis differs from financial analysis in that it examines the full effects of a project on a country's economy. While financial analysis examines only the explicit monetary costs and benefits of a subproject, economic analysis examines hidden opportunity costs and benefits to using resources in such a way The general principle of economic analysis is to compare the real benefits of a Project to its real costs.

In performing the economic analysis for the Private Sector Energy Development Project, it must be recognized that because the project limits its funding to feasibility studies, training, and technical assistance, no specific actual subprojects, e.g. power plants can be analyzed. Additionally, among these funded items, it is not realistic to attempt to quantify the economic

benefits of the training sessions, seminars, and technical assistance. Although these items may provide long term benefits in areas such as tariff restructuring, there is no way to quantify these benefits. Thus, the economic analysis focuses on the expected economic benefits of the subprojects that were facilitated by the use of the PSED Project's Feasibility Study Fund. In particular, the analysis attempts to quantify the cost of power shortages in developing countries given the general loss of productivity due to the frequent loss of power. Each new kwh of electricity produced as a result of the PSED Project Feasibility Study Fund serves to reduce the cost of power shortages in developing countries. Therefore, the economic benefits of the PSED Project can be calculated by measuring the savings accumulated from increasing the electrical generating capacity in developing countries.

The analysis suggests that the economic returns to the PSED Project are positive and that the project is economically viable. The economic Net Present Value (NPV) for the project is estimated at $805 million dollars, with an economic internal rate of return of 57%. Analysis was also performed to test the sensitivity of these results to the estimate used for the cost of unserved energy. The project NPV is positive all the way down to an estimated cost of unserved energy of $8/MWh -- while studies suggest that this cost is in the range of $500/MWh or higher.

4. Social Soundness Analysis Summary

The power supply problem has adversely affected the social and economic development of many developing countries. Social programs are constrained not only by the lack of reliable electricity available to them, but also by loss of development funds which the government must divert from social programs to the power sector development. Private investment in the power sector will provide alternative forms of financing for the development of the power sector and will improve the reliability and availability of electricity.

Specifically, an improved power supply should increase the amount of power available for education, health care, agriculture, and industry. Some examples include:

1) Education. Electricity is associated with information transfer, classroom conditions, and study habits. For instance, studies have found that children who can read by electric light spend more time reading at home than those who lack electric light.

2) Vaccination. Vaccines for many human and livestock diseases require refrigeration. The total annual worldwide losses from diseases that could have been prevented by vaccination if refrigeration were more widely available are

probably in the billions of dollars. Although refrigeration can be provided through non-electric technologies, expansion of electric refrigeration would simplify the effort.

3) Political Stability. Development, rather than electrification, is the key to building support for a government or political system. It is clear from anecdotal evidence, however, that failure to maintain reliable electricity services and acceptable prices of electricity for existing users can result in general public dissatisfaction and potential political instability.

5. Administrative Analysis Summary

Implementation of the PSED Project as proposed will not have any unusual requirements for A.I.D. administrative support capabilities. An expanded Administrative Analysis can be found in Annex H. The PSED Project will be managed by Office of Energy, which will provide centralized project supervision and a mechanism for dissemination and interpretation of project results as needed in the broader A.I.D. policy and programming process. The Project Director and Core Project Staff Contractor for the PSED Project will report to the A.I.D. Project Officer appointed by the Office of Energy.

The PSED Project will affect Mission workloads and may possibly affect staffing requirements. However, this will likely be minimized since the core staff and consultants will have considerable experience at operating with the A.I.D. administrative system. Project support services on the part of participating Missions are generally expected to be minimal. It is expected that this project can be successfully implemented and managed given present staffing levels within the Office of Energy.

6. Environmental Analysis Summary

One objective of the private energy development projects in the developing countries is to promote the use of innovative, yet proven, technologies which can more efficiently utilize energy resources with reduced environmental impacts. The industrial countries of the world have only recently, within the last 25 years, recognized the adverse impacts of electric power production on environmental quality and human health. The projected expansion of electricity generation in developing countries could therefore pose serious environmental problems in these areas unless appropriate measures to mitigate such impacts are incorporated in the planning and implementation process.

The construction of power generating facilities may impact the air, water, ecological, and social resources of the host country. The significance of these impacts will depend on the type of power plant installed and on the local environment. The

type of plant and its associated energy source, e.g., coal, oil, gas, or hydro, will dictate the magnitude and nature of pollutants discharged to the environment. For example, use of high sulfur coal will result in higher atmospheric emissions than if the plant was fired by natural gas. Secondary effects which impact on the social, health, and safety aspects are associated with development of natural resources for use by the power plant. Examples include coal mining, dam construction for hydropower, and diversion of water from agricultural sources. The local environment factor depends on the ability of the area to assimilate the effects of the physical plant, including its pollutant discharges and social demands such as employment and civic services.

Electric power projects can impact directly on air resources with the potential impact of sulfur dioxide, nitrogen oxides, and particulate matter. Water resources can be affected by water discharges including cooling system blowdown, boiler feed water blowdown, demineralizer back wash and coal storage piles, and normal storm drainage from the plant site. Ecological impacts can include the removal of habitat by plant construction, entrapment of aquatic organisms in cooling systems and the effects of transportation systems.

Unlike the United States and other industrialized nations, many developing countries do not have adequate standards and policies in place for environmental management. However, some of these countries are in the process of establishing such policies. For instance, the Pakistan Environmental Ordinance of 1983 initiated a mechanism for establishing a national environmental policy including the development of air and water quality standards. While no standards have yet been adopted, proposed standards to restrict the discharge of pollutants into the atmosphere and water have been drafted.

It is not anticipated that the PSED Project will involve activities affecting the physical environment, because the Project will finance only technical assistance, training and feasibility studies. Of course, the actual construction of electric power generation, and transmission facilities, which themselves are outside the scope of this project, may have significant impacts on the environment. However, due to A.I.D.'s commitment to sound environmental practices, appropriate training and technical assistance activities will address environmental concerns. In addition, to the extent the Project would also support feasibility studies possibly leading, at some future time, to the construction of facilities, such studies would incorporate attention to environmental aspects of the proposed energy activities as appropriate.

For private power subprojects, a prefeasibility study is undertaken to decide whether the subproject is technically and

economically attractive. This study phase typically addresses the site selection; fuel type, source, and availability; technology choice; plant size and market potential; preliminary design and project economics; legal and environmental issues. In this phase of development, a preliminary environmental characterization of the project is made.

As a part of the feasibility study, a baseline environmental characterization is conducted. This activity involves collecting information on the air quality, meteorological conditions, ecology, water resources, and socioeconomic aspects of the plant site and surrounding area. This information is used in the feasibility study to determine the potential environmental impacts. As part of this analysis, conformance with ambient air and water quality criteria is assessed, as well as any significant impact to the social and ecological environment. If a potential impact is found to be significant, then design alternatives must be evaluated to mitigate the effect to an acceptable level.

The feasibility study would disclose the environmental baseline and impact information that was developed for the subproject. It also would detail the proposed mitigation and monitoring procedures to be used during the construction and operating phases of the subproject.

In the absence of specific environmental regulations for power plant projects in the developing countries, it would be appropriate to use the guidelines established by the World Bank.

ANNEX B

LOG FRAME MATRIX

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

AID 1020-25 (1-79)

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 89 to FY 94
Total U.S. Funding $15,400,000
Date Prepared: February 22, 1989

Project Title & Number: Private Sector Energy Development 936-5738

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal The broader objective to which this project contributes. To accelerate the sustainable economic & social development of AID-assisted countries by increasing the supply of reliable, affordable energy, particularly electric power, for productive purposes.	**Measures of Goal Achievement** 1. Increases in GNP, i.e. income, employment, investment & production 2. Increases in MWs of power produced & delivered	1. Project mid-term & end-of-project evaluations 2. Reports & statistics from Ministries of Finance, Energy & Industry 3. Annual reports on economic indicators. 4. CDSS's 5. Contractor reports	**Assumptions for achieving goal targets** Developing countries acknowledge power shortages as problem, continue to accord policy priority & commit resources to this sector
Project Purpose: To assist in creating a favorable environment to encourage private ownership, financing and operation of energy facilities in selected developing countries, concentrating on the electric power sector.	**Conditions that will indicate purpose has been achieved: End of project status.** 1. Favorable legal & institutional environments established in developing countries conducive to private participation in the energy sector 2. Private sector resources mobilized. 3. Private sector energy projects approved. 4. $500M committed for investment in private sector energy projects. 5. 5 private energy projects implemented. 6. 500 MWs of additional installed capacity & delivered	1. Project mid-term & end-of-project evaluations 2. Reports & statistics from Ministries of Finance, Energy & Industry 3. Contractor reports	**Assumptions for achieving purpose:** 1. Sufficient number of AID-assisted countries & A.I.D. missions interested 2. Favorable policy & institutional environment in host countries. 3. Private sector in U.S. & host countries is interested & will commit resources.

Outputs:	Magnitude of Outputs:		Assumptions for achieving outputs:
1. Assessments of potential for private power in selected countries. 2. Private energy Feasibility Study Fund to cost share studies for potential private energy projects with project developers. 3. Special studies of potential macro-economic impact of private power on developing countries, of the requirements for local capital market development, & alternative forms of private sector participation. Conferences & Workshops on private power with government officials, utility personnel & private sector representatives. 5. Private energy Technical Assistance Teams to assist developing countries & project developers. 6. Formal training courses on private participation in energy sector. 7. Internship training with U.S. utilities & utility regulatory commissions on institutional arrangements for, & regulation of, private power provided to officials from developing countries. 8. Energy consultants to selected A.I.D. regions. 9. Study Tours to bring officials of developing countries to the U.S. to visit private power facilities & meet with project developers, utilities & regulators. 10. Project Technical Advisory Group to ensure coordination within U.S. govt. & with private sector. 11. Cooperation arranged between A.I.D., IFC, multilateral development & other bilateral donors to promote private power. Supervision of private energy data base.	1. 8 Country Assessments. 2. Establish Feasibility Study Fund & fund 25 prefeasibility/feasibility studies. 3. 5 Special Studies of policies & guidelines, macroeconomic impact, capital markets, financing programs, etc. 4. 3 Conferences & 8 Workshops. 5. 10 Tech. Assist. Team missions. 6. 3 Training Courses with 60 persons trained. 7. 20 Internships. 8. 1 Reg. Energy Consultant in field. 9. 6 Study Tours. 10. Establish 1 Technical Advisory Group. 11. 15 meetings with multilateral development organs & other bilateral donors. 12. Maintain 1 private energy data base. 13. $500M from private sector invested. 14. 8 countries with improved laws & regulations.	1 Project mid term & end-of-project evaluations. 2 Reports & statistics from Ministries of Finance, Energy & Industry. 3. Contractor reports.	1. Cooperation of host governments & utilities. 2. Ability to hire appropriate personnel. 3. Sufficient resources are made available. 3. Mission cooperation & buy-ins. 4. Willingness of private sector to commit resources.
Inputs:	**Implementation Target (Type and Quantity)**		**Assumptions for providing inputs:**
1. Costsharing arrangements for prefeasibility & feasibility studies & other studies. 2. Technical assistance. 3. Training in regulating & implementing private power. 4. Personnel: Project officer & support staff.	1. Feasibility Study Fund - $3M (S&T/EY) + $3.4M other. 2. Technical assistance - $6.3M (S&T/EY) + $1.9M other. 3. Training - $.3M (S&T/EY) + $.3M other. 4. Evaluations - $.2M (S&T/EY). 5. Private energy projects - $500M other.	1 Project mid-term & end-of-project evaluations. 2 Reports & statistics from Ministries of Finance, Energy & Industry. 3. Contractor reports.	1. A.I.D. commitment of resources. 2. Availability of appropriate management personnel & contractors.

ANNEX C

STATUTORY CHECKLIST

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT
(PSED)

Project Number 936-5738

3M(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A includes criteria applicable to all projects. Part B applies to projects funded from specific sources only: B(1) applies to all projects funded with Development Assistance; B(2) applies to projects funded with Development Assistance loans; and B(3) applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 1988 Continuing Resolution Sec. 523; FAA Sec. 634A. If money is sought to obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified to Congress, has Congress been properly notified?

N/A

2. FAA Sec. 611(a)(1). Prior to an obligation in excess of $500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

YES.

3. FAA Sec. 611(a)(2). If legislative action is required within recipient country, what is the basis for a reasonable expectation that such action will be completed in time to permit orderly accomplishment of the purpose of the assistance?

Assistance & projects will be undertaken in countries having the most potential for any legislative action necessary.

4. FAA Sec. 611(b); FY 1988 Continuing Resolution Sec. 501. If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for guidelines.)

N/A

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and total U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively?

N/A

6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

N/A

7. FAA Sec. 601(a). Information and conclusions on whether projects will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

Private sector devel. will encourage export of U.S. equipment & services.

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

Project will promote U.S. trade & investment abroad through feasibility studies.

9. FAA Secs. 612(b), 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

This will be addressed when subprojects are undertaken.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

N/A

11. FY 1988 Continuing Resolution Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?

N/A

12. FY 1988 Continuing Resolution Sec. 553. Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel?

N/A

13. FAA Sec. 119(g)(4)-(6). Will the assistance (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas? (a), (b) & (c) are not applicable. Regarding (c), assurances will be required before supporting subproject feasibility studies.

14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (either dollars or local currency generated therefrom)?

N/A

15. FY 1988 Continuing Resolution. If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government? Probably not implemented by PVO's, however, if so, this requirement will be satisfied.

16. FY Continuing Resolution Sec. 541. If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.? Probably not implemented by PVO, however, if so, this requirement will be satisfied.

17. FY 1988 Continuing Resolution Sec. 514. If funds are being obligated under an appropriation account to which they were not appropriated, has prior approval of the Appropriations Committees of Congress been obtained?

N/A

18. FY Continuing Resolution Sec. 515. If deob/reob authority is sought to be exercised in the provision of assistance, are the funds being obligated for the same general purpose, and for countries within the same general region as originally obligated, and have the Appropriations Committees of both Houses of Congress been properly notified?

N/A

19. State Authorization Sec. 139 (as interpreted by conference report). Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision).

N/A

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FY 1988 Continuing Resolution Sec. 552 (as interpreted by conference report). If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities (a) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U.S. exporters of a similar agricultural commodity; or (b) in support of research that is intended primarily to benefit U.S. producers?

N/A

b. FAA Secs. 102(b), 111, 113, 281(a). Describe extent to which activity will (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries.
Energy projects may be undertaken in rural areas thereby dispersing investment. upgrading living standards, electrifying homes & businesses.

c. FAA Secs. 103, 103A, 104, 105, 106, 120-21. Does the project fit the criteria for the source of funds (functional account) being used?

YES

d. FAA Sec. 107. Is emphasis placed on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?
Studies will be done to determine most appropriate technologies.

e. FAA Secs. 110, 124(d). Will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?

N/A

f. FAA Sec. 128(b). If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority?

YES

g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

Project is designed to work with host country officials & personnel.

h. FY 1988 Continuing Resolution Sec. 538. Are any of the funds to be used for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions?

NO

Are any of the funds to be used to pay for the performance of involuntary sterilization as a method of family planning or to coerce or provide any financial incentive to any person to undergo sterilizations?

Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning?

i. FY 1988 Continuing Resolution. Is the assistance being made available to any organization or program which has been determined to support or participate in the management of a program of coercive abortion or involuntary sterilization?

NO

If assistance is from the population functional account, are any of the funds to be made available to voluntary family planning projects which do not offer, either directly or through referral to or information about access to, a broad range of family planning methods and services?

NO

j. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

YES

k. FY 1988 Continuing Resolution. What portion of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, colleges and universities having a student body in which more than 20 percent of the students are Hispanic Americans, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)?

Some 8a Contracts will be used on this project.

l. FAA Sec. 118(c). Does the assistance comply with the environmental procedures set forth in A.I.D. Regulation 16? Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent feasible: (a) stress the importance of conserving and sustainably managing forest resources; (b) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (c) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (d) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices; (e) help conserve forests which have not yet been degraded by helping to increase production on lands already cleared or degraded; (f) conserve forested watersheds and rehabilitate those which have been deforested; (g) support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (h) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (i) conserve biological diversity in forest areas by supporting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation, and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas; (j) seek to increase the awareness of U.S. government agencies and other donors of the immediate and long-term value of tropical forests, and (k) utilize the resources and abilities of all relevant U.S. government agencies? This will be addressed when project activities are undertaken.

m. FAA Sec. 118(c)(13). If the assistance will support a program or project significantly affecting tropical forests (including projects involving the planting of exotic plant species), will the program or project (a) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and (b) take full account of the environmental impacts of the proposed activities on biological diversity?

N/A

n. FAA Sec. 118(c)(14). Will assistance be used for (a) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; or (b) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas?

N/A

o. FAA Sec. 118(c)(15). Will assistance be used for (a) activities which would result in the conversion of forest lands to the rearing of livestock; (b) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands; (c) the colonization of forest lands; or (d) the construction of dams or other water control structures which flood relatively undegraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development?

NO

p. FY 1988 Continuing Resolution If assistance will come from the Sub-Saharan Africa DA account, is it (a) to be used to help the poor majority in Sub-Saharan Africa through a process of long-term development and economic growth that is equitable, participatory, environmentally sustainable, and self-reliant; (b) being provided in accordance with the policies contained in section 102 of the FAA; (c) being provided, when consistent with the objectives of such assistance, through African, United States and other PVOs that have demonstrated effectiveness in the promotion of local grassroots activities on behalf of long-term development in Sub-Saharan Africa; (d) being used to help overcome shorter-term constraints to long-term development, to promote reform of sectoral economic policies, to support the critical sector priorities of agricultural production and natural resources, health, voluntary family planning services, education, and income generating opportunities, to bring about appropriate sectoral restructuring of the Sub-Saharan African economies, to support reform in public administration and finances and to establish a favorable environment for individual enterprise and self-sustaining development, and to take into account, in assisted policy reforms, the need to protect vulnerable groups; (e) being used to increase agricultural production in ways that protect and restore the natural resource base, especially food production, to maintain and improve basic transportation and communication networks, to maintain and restore the natural resource base in ways that increase agricultural production, to improve health conditions with special emphasis on meeting the health needs of mothers and children, including the establishment of self-sustaining primary health care systems that give priority to preventive care, to provide increased access to voluntary family planning services, to improve basic literacy and mathematics especially to those outside the formal educational system and to improve primary education, and to develop income-generating opportunities for the unemployed and underemployed in urban and rural areas?

N/A

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan at a reasonable rate of interest.

N/A

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20 percent of the enterprise's annual production during the life of the loan, or has the requirement to enter into such an agreement been waived by the President because of a national security interest?

N/A

c. FY 1988 Continuing Resolution. If for a loan to a private sector institution from funds made available to carry out the provisions of FAA Sections 103 through 106, will loan be provided, to the maximum extent practicable, at or near the prevailing interest rate paid on Treasury obligations of similar maturity at the time of obligating such funds?

N/A

d. FAA Sec. 122(b). Does the activity give reasonable promise of assisting long-range plans and programs designed to develop economic resources and increase productive capacities?

N/A

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA?

YES

b. FAA Sec. 531(e). Will this assistance be used for military or paramilitary purposes?

NO

c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

N/A

ANNEX D

PROJECT TECHNICAL ANALYSIS

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

PROJECT TECHNICAL ANALYSIS- ANNEX D

1. Power Generation in Lesser Developed Countries (LDCs)

Electrical energy has traditionally played a key role in the agricultural, industrial, and social development of a county. In general, about 50 percent of the electricity production in developing countries is used by industry and the remainder is consumed in the agricultural, commercial, and residential sections.

Recent annual statistics for electricity productions in the developing countries are presented in Table 1.0. The fairly large percentages of electrical generation attributed to hydro and geothermal sources are indicative of developing economies in these countries. By comparison, the split for electric power generation in the United States is:

Fossil Fuel- 73%, Hydro & Geothermal- 14%, Nuclear Energy- 13%

Of the developing countries, only India, Pakistan, and South Africa have nuclear power generating capabilities which account for 1 - 3% of their total production.

TABLE 1.0
ELECTRICAL ENERGY PRODUCTION IN
DEVELOPING COUNTRIES(1)

LATIN AMERICA - CARIBBEAN

COUNTRY	ELECTRICITY(2) PRODUCTION MILLION-KWH	% PRODUCTION FOSSIL FUEL	% PRODUCTION HYDRO & GEOTHERMAL	% PRODUCTION OTHER
BRAZIL	175,710	6	94	
MEXICO	87,083	71	29	
COLUMBIA	27,800	27	73	
PERU	11,769	26	74	
ECUADOR	4,400	60	40	
DOMINICAN REP.	4,009	87	13	
URUGUAY	3,637	4	96	
COSTA RICA	3,067	3	97	
JAMAICA	2,400	94	6	
PANAMA	2,360	37	63	
BOLIVIA	1,695	29	71	
EL SALVADOR	1,684	7	93	
GUATEMALA	1,625	63	37	
HONDURAS	1,060	18	82	
HAITI	375	31	69	
BARBADOS	360	100		
GRENADA	25	100		

(1) Source: World Resources 1987

TABLE 1.0 - Cont.
ELECTRICAL ENERGY PRODUCTION IN DEVELOPING COUNTRIES[1]

ASIA - NEAR EAST

COUNTRY	ELECTRICITY[2] PRODUCTION MILLION-KWH	% PRODUCTION		
		POSSIL FUEL	HYDRO & GEOTHERMAL	OTHER
INDIA	165,440	65	33	2
TURKEY	30,630	56	44	
EGYPT	22,870	54	46	
THAILAND	22,029	81	19	
PAKISTAN	21,873	40	59	1
INDONESIA	21,330	90	10	
PHILIPPINES	20,800	39	61	
PORTUGAL	19,033	58	42	
MOROCCO	6,617	94	6	
BANGLADESH	4,292	79	21	
TUNISIA	3,590	99	1	
JORDAN	2,304	100		
SRI LANKA	2,261	8	92	
BURMA	1,726	50	50	
OMAN	1,675	100		
FIJI	387	26	74	
NEPAL	350	10	90	
YEMEN ARAB REP.	295	100		

(1) Source: World Resources 1987
(2) Annual production in 1984

TABLE 1.0 - Cont.
ELECTRICAL ENERGY PRODUCTION IN DEVELOPING COUNTRIES[1]

AFRICA

COUNTRY	ELECTRICITY[2] PRODUCTION MILLION-KWH	% PRODUCTION		
		FOSSIL FUEL	HYDRO & GEOTHERMAL	OTHER
SOUTH AFRICA	122,383	96	1	3
ZAMBIA	10,080	1	99	
NIGERIA	8,835	76	24	
ZAIRE	4,558	3	97	
ZIMBABWE	4,538	24	76	
KENYA	2,253	23	77	
CAMEROON	2,230	5	95	
MOZAMBIQUE	1,945	21	79	
COTE d'IVOIRE	1,918	46	54	
GHANA	1,830	2	98	
SUDAN	1,032	50	50	
LIBERIA	897	62	38	
TANZANIA	870	29	71	
ETHIOPIA	760	25	75	
SENEGAL	684	100	--	
UGANDA	655	1	99	
BOTSWANA	621	---	--	
MALAWI	511	5	95	
GUINEA	499	84	16	
MADAGASCAR	452	45	55	
SWAZILAND	310	---	--	
SIERRA LEONE	280	100	--	
NIGER	245	100	--	
TOGO	234	64	36	
MALI	153	22	78	
DJIBOUTI	148	100	--	
RWANDA	135	---	100	
BURKINA FASO	115	100	--	
MAURITANIA	102	100	--	
SOMALIA	75	100	--	
CHAD	65	100	--	
GAMBIA	42	100	--	
CAPE VERDE	25	100	--	
GUINEA-BISSAU	14	100	--	
BURUNDI	2	100	--	
LESOTHO	1	---	--	

(1) Source: World Resources 1987
(2) Annual production in 1984

Historically, for both developed and developing countries, there has been a direct correlation between energy use, particularly electrical energy, and the Gross Domestic Product (GDP). This relationship is evident in the summary of electricity usage for the developing countries given in Table 2.0. For each geographical region, the countries are listed according to their Gross Domestic Product. By comparison with Table 1.0, it is apparent that the GDP ranking generally corresponds to the annual electricity production for these countries.

Production in the developing economies also tends to emphasize energy intensive manufacturing. This reflects the desire to increase the domestic output without regard for energy efficiency, which is the keynote of the more developed economies like the United States. Consequently, the electricity usage per dollar of gross domestic product may also be used as a measure of the developing countries growth towards technical maturity. For comparison purposes, the ratio of KWH/$ GPD for the United States is about 0.6.

The energy intensity of economic activity, defined as the ratio of total energy consumption to GDP, is projected (1) to decline steadily between now and the year 2000. While this decline is expected to occur in all countries, the energy intensity is projected to remain the highest in the developing regions.

TABLE 2.0 .
ELECTRICAL ENERGY USAGE IN
DEVELOPING COUNTRIES

LATIN AMERICA - CARIBBEAN

COUNTRY	GDP[1] BILLION $	$GDP/CAPITA	INDUSTRY % GDP	ELECTRICITY USE KWH/$GDP	KWH/CAPITA
BRAZIL	206.8	1,494	39	0.85	1,270
MEXICO	127.1	1,585	39	0.68	1,086
COLOMBIA	29.7	1,023	25	0.94	959
PERU	25.4	1,281	38	0.46	594
ECUADOR	11.5	1,199	42	0.38	458
GUATEMALA	7.5	911	--	0.22	198
DOMINICAN REP.	5.3	800	30	0.76	607
URUGUAY	5.3	1,773	33	0.68	1,112
PANAMA	5.1	2,327	18	0.46	1,073
COSTA RICA	4.3	1,638	29	0.72	1,180
BOLIVIA	4.2	633	23	0.40	257
EL SALVADOR	4.0	812	21	0.42	344
HONDURAS	3.0	658	25	0.36	236
JAMAICA	2.4	1,012	40	0.99	1,000
HAITI	2.2	352	--	0.17	62

(1) 1986 GROSS DOMESTIC PRODUCT
Source: World Development Report 1988

TABLE 2.0 - Cont.
ELECTRICAL ENERGY USAGE IN
DEVELOPING COUNTRIES

ASIA - NEAR EAST

COUNTRY	GDP(1) BILLION $	$GDP/CAPITA	INDUSTRY % GDP	ELECTRICITY USE KWH/$GDP	KWH/CAPITA
INDIA	203.8	261	29	0.81	212
INDONESIA	75.2	452	32	0.28	128
TURKEY	52.6	1,022	36	0.58	595
THAILAND	41.8	794	30	0.53	419
EGYPT	40.9	822	29	0.56	460
PHILIPPINES	30.5	533	32	0.68	363
PAKISTAN	30.1	303	28	0.73	221
PORTUGAL	27.5	2,694	40	0.69	1,866
BANGLADESH	15.5	150	14	0.28	42
MOROCCO	14.8	656	30	0.45	294
BURMA	8.2	215	13	0.21	45
TUNISIA	7.8	1,067	33	0.46	492
OMAN	7.3	5,630	23	0.23	1,288
SRI LANKA	5.9	365	27	0.38	140
YEMEN ARAB REP.	4.8	580	16	0.06	36
JORDAN	4.0	1,111	28	0.58	640
NEPAL	2.2	129	11	0.16	21

(1) 1986 GROSS DOMESTIC PRODUCT
Source: World Development Report 1988

TABLE 2.0 - Cont.
ELECTRICAL ENERGY USAGE IN
DEVELOPING COUNTRIES

AFRICA

COUNTRY	GDP[1] BILLION $	$GDP/CAPITA	INDUSTRY GDP	ELECTRICITY USE KWH/$GDP	KWH/CAPITA
SOUTH AFRICA	56.4	1,745	46	2.17	3,789
NIGERIA	49.1	476	29	0.18	86
CAMEROON	11.3	1,074	35	0.20	212
SUDAN	7.5	330	15	0.14	46
COTE d'IVOIRE	7.3	684	24	0.26	179
ZAIRE	6.0	190	36	0.76	144
KENYA	6.0	281	20	0.38	106
GHANA	5.7	433	17	0.32	139
ETHIOPIA	5.0	114	15	0.15	18
ZIMBABWE	4.9	568	46	0.92	522
MOZAMBIQUE	4.3	303	12	0.45	137
TANZANIA	4.0	175	10	0.22	39
SENEGAL	3.7	550	27	0.18	101
UGANDA	3.3	218	6	0.20	43
MADAGASCAR	2.7	252	16	0.17	43
SOMALIA	2.3	422	9	0.03	14
NIGER	2.1	315	16	0.12	37
GUINEA	2.0	314	22	0.25	79
RWANDA	1.9	298	23	0.07	22
ZAMBIA	1.7	240	48	6.07	1,460
MALI	1.7	217	13	0.09	20
SIERRA LEONE	1.2	310	22	0.24	74
BOTSWANA	1.2	1,045	58	0.54	565
MALAWI	1.1	149	18	0.46	69
BURUNDI	1.1	227	17	0.01	1
LIBERIA	1.0	430	28	0.91	390
TOGO	1.0	316	20	0.22	75
BURKINA FASO	0.9	115	22	0.12	14
MAURITANIA	0.8	417	24	0.14	57
LESOTHO	0.2	144	27	0.01	1

(1) 1986 GROSS DOMESTIC PRODUCT
Source: World Development Report 1988

Reduction in energy intensity, especially in the more industrial economies, results from efforts to increase energy conservation and efficiency as well as from shifting activity towards less energy intensive services and new technologies. As shown below, the energy/GDP ratio in the developing countries actually rose during the 1980-1985 period, reflecting a growth in energy consumption of about 5% per year. These countries had difficulty reducing the growth in energy usage even though the overall economic activity grew at a rate of only 1.1% per year.

Growth Rates in Developing Countries

	Annual GDP Growth, %	Energy Consumption/GDP Growth Ratio
1970-1980	5.4	1.31
1980-1985	1.1	4.45
1985-1990	2.9	1.00
1990-2000	3.8	0.79

During the 1980-1985 period, the demand for electricity in most developing countries out-paced the general growth in energy consumption and increased by 7% per year. This high growth rate was, in part, due to energy intensive industrial uses coupled with urban development which increased the residential power consumption.

Furthermore, many of these countries embarked on extensive rural electrification programs in an effort to promote rural development and control population shifts towards the urban sections. These forces will likely continue to influence the demand for electricity for the foreseeable future. Consequently, while the average GDP is expected to grow at 3-4% through the year 2000, the demand for electrical energy will likely increase by 4-5% in the developing countries.

Most developing countries are experiencing severe power shortages that hamper their development plans and economic activities. Among Asian countries, for example, the Philippines has a power shortage of about 8 percent of demand, Pakistan over 25 percent, Bangladesh about 20 percent, and India 15 percent. Since the electric utilities in developing countries are owned and operated by the government, power expansion requirements have become a major financial burden to the national budget. In most developing countries, over 20 percent of the development budget has been devoted to the power sector; a proportion that represents more than 60 percent of the budget for all energy activities. Moreover, because much of the capital invested in the power sector is borrowed from

the international market, the government's ability to raise funds for other development activities has been drastically curtailed. In many countries, outstanding loans for the power sector represent over 40 percent of the national foreign debt.

The utilities in most developing countries have been facing increasing operational, financial, and technical difficulties. In many utilities, the availability factor - defined as the fraction of time that a power system is capable of operation - is less than 60 percent, compared with an average of over 85 percent in the United States and other industrialized countries. And the transmission and distribution losses in the power systems of most developing countries are over 20 percent, compared with under 8 percent in the United States. Finally, utilities in developing countries are unable to raise enough revenue to recover their operating expenses. As a result, they have become major sink holes of government subsidies. Under these circumstances, utilities can neither effectively expand their generating capacity nor keep pace with the growing demand of power.

The industrial sector in developing countries has been especially affected by power shortages. In some countries, industry receives only 20 percent of it power needs during the peak demand season. The loss of production because of power cuts, estimated at over one order of magnitude higher than the actual cost of power, has considerably slowed industrial growth in these countries. In many regions of developing countries, industrial expansion is delayed because new factories cannot obtain a tie-in to the grid. To reduce the [illegible] of power shortages, private [illegible] are installing small, inefficient diesel generators that use expensive imported fuels. Such a practice only increases the country's dependence on imported petroleum products.

2. Technical Approaches to the Power Crisis

In general, electric power generation in developing countries is monopolized by state controlled utilities. These large bureaucracies are relatively inefficient and lack aggressive management and creative planning abilities. Consequently, these utilities tend to follow the traditional approaches to their problems, which are defined strictly as a lack of generating capacity. The usual solution is, therefore, to design and build additional power plants without considering alternative approaches, such as advanced technology, renewable energy sources, and energy conservation strategies. With the proper infrastructure and technical support, the developing countries could take advantage of numerous technical and operational innovations which have the potential to alleviate their power problems.

o Modernize Existing Facilities

The majority of thermal power plants in developing countries operate at less than rated capacity and have relatively low thermal efficiencies. Furthermore, the availability of these power plants for useful production is generally below that achieved in the industrialized nations. The inefficient performance of these plants is, largely due to design deficiencies, inferior fuel quality, and poor operating management. Low plant availability is usually caused by inadequate maintenance schedules and the unavailability of spare parts. Improved plant performance could be achieved with a minimum investment of resources. Through a concerted effort of technical, operational, and managerial expertise, an analysis of plant performance could identify the causes for operating problems and inefficiencies. This analysis would provide recommendations for design improvements, operator training, fuel switching, and preventive maintenance.

While an in-depth analysis of the potential for power plant modernization in the developing countries has not been conducted, the limited information available (3) suggest that rehabilitation of inefficient systems can increase the available generating capacity by 8-10%. Furthermore, in developing economies, where peak demand grows faster than the average electrical demand, load management offers an option which can reduce the need for additional generating capacity. This approach requires the efforts of power sector planners to coordinate reduction of peak loads with the local industrial management.

o Energy Conservation

A financially attractive alternative to increased generating capacity is to reduce the energy losses associated with the distribution and end-uses of electricity. In the industrial and commercial sectors alone, the developing countries could realize significant savings through adoption of energy efficient technology. For instance, factories in these countries devote 2-5 times more power to a specific operation than do modern plants in industrialized nations (4).

In most developing countries, the capital stock was not designed or built with energy efficiency in mind. In addition, production and operating practices are often wasteful of energy. Studies in developing countries indicate that conservation projects using existing techniques and processes can save an estimated 10 to 30 percent of the energy consumed in the industrial sector.

Such projects in the power sector can save from 10 to 25 percent of the energy used, mostly through the rehabilitation of the electrical distribution and transmission systems.

Many low-cost energy-saving measures can be carried out in a few months, and most other measures can be implemented within a few years. In addition, these measures are very cost-effective with paybacks of less than three years (4).

o Alternate Energy Sources

Most developing countries are emphasizing the use of indigenous energy resources for future power generation, in an attempt to restrict the amount of imported oil. Based on the available data, Table 3.0 summarizes the proven reserves of fossil fuels in the developing countries. From this data it is quite apparent that, with few exceptions, the supply options for these countries are limited. Coal and hydro-power represent the dominant alternatives to imported oil for electric power generation. The available coal in many of these countries has high ash content and is a poor quality fuel. Furthermore, development of indigenous coal resources has proved to be a very costly undertaking.

Largely in response to the shock of oil price increases, some countries began pursuing renewable energy sources. Of the developing countries, Brazil, India, and the Philippines achieved some significant results but other efforts failed due to the lack of strong program management and because some technologies proved too expensive (2). The major forms of renewable energy which offer alternatives to fossil fuels for electric power generation include hydropower, geothermal, biomass, wind power, and solar power.

TABLE 3.0
COMMERCIAL ENERGY RESOURCES IN DEVELOPING COUNTRIES[1]

LATIN AMERICA - CARIBBEAN

PROVEN RESERVES

COUNTRY	COAL MILLION MT	CRUDE OIL MILLION MT	NATURAL GAS BILLION M^3
BRAZIL	23,000	371	81
MEXICO	2,243	6,907	2,134
COLOMBIA	2,073	71	140
PERU	28	116	34
ECUADOR	--	228	3,238
GUATAMALA	--	8	--
HONDURAS	21	--	--
HAITI	13	--	--

ASIA -NEAR EAST

PROVEN RESERVES

COUNTRY	COAL MILLION MT	CRUDE OIL MILLION MT	NATURAL GAS BILLION M^3
INDIA	27,910	471	420
TURKEY	4,210	38	15
EGYPT	25	400	85
THAILAND	470	--	112
PAKISTAN	145	13	450
INDONESIA	693	6,738	900
PHILIPPINES	170	3	--
PORTUGAL	72	--	--
MOROCCO	178	40	--
BANGLADESH	1,054	--	192
TUNISIA	--	231	135
BURMA	5	4	250
OMAN	--	351	57

(1) Source: World Resources 1987

TABLE 3.0 - Cont.
COMMERCIAL ENERGY RESOURCES IN
DEVELOPING COUNTRIES(1)

AFRICA

PROVEN RESERVES

COUNTRY	COAL MILLION MT	CRUDE OIL MILLION MT	NATURAL GAS BILLION M^3
SOUTH AFRICA	112,000	--	--
ZAMBIA	32	--	--
NIGERIA	338	2,251	1,200
ZAIRE	600	20	2
ZIMBABWE	1,600	--	--
CAMEROON	--	66	150
MOZAMBIQUE	240	--	--
COTE d'IVOIRE	--	43	--
TANZANIA	304	--	--
BOTSWANA	7,000	--	--
MALAWI	25	--	--
MADAGASCAR	1,075	--	--
SWAZILAND	2,020	--	--
SUDAN	--	27	3
NIGER	5	--	--

(1) Source: World Resources 1987

Hydropower

Substantial potential exists to convert falling water into electricity. Two-thirds of the unexploited hydropower potential lies in developing countries. Organization of Economic Cooperation and Development (OECD) nations have exploited about 50 percent of their usable opportunities, and the USSR and Eastern Europe have tapped about 20 percent, but developing countries have utilized only 7 percent of their available resources. Among them, Brazil, China, Colombia, India, Peru, and Zaire have the largest untapped potential. The following table shows the worldwide hydropower potential and use by geographic region.

	Technically Exploitable Potential (Megawatts)	Share of Potential Exploited (Percent)
Asia	610,100	9
South America	431,900	8
Africa	358,300	5
North America	356,400	36
USSR	250,000	12
Europe	163,000	59
Oceania	45,000	15
World Total	2,214,700	17

Most hydropower projections include only large dams, but a great deal can be expected from decentralized, small-scale 1-10 megawatt stations. Because these units use local energy sources to satisfy local needs, they can contribute to rural development in greater proportion to the amount of energy they deliver. By 1982, China had build some 80,000 small dams, averaging about 70 kilowatts. Small-scale hydro stations in the United States, many of which have come on line since 1978, numbered 1,410, with a combined capacity of 7,019 megawatts in 1983.

Further hydro development will be restricted more by lack of money and markets for the power than by a lack of possible sites for projects. Construction costs for dams have increased less sharply than for nuclear or thermal generating stations, but the World Bank projects that $50 billion will be needed for dam construction between 1982 and 1990 if hydropower is to meet the Bank's goal of 43 percent of Third World electricity production in 1995.

Geothermal

The earth's natural interior heat is enormous but difficult to harness with present technologies. Nonetheless, world geothermal capacity grew by 8.3 percent per year from 1920 to 1978, and by 16.5 percent per year from 1978 to 1985. In 1985, an estimated 4,800 megawatts were produced and, by 1990, output is expected to increase to 6,400 megawatts.

The United States, which leads the world in geothermal capacity, increased the capacity more than threefold since 1975 to over 2,000 megawatts in 1985. Mexico has developed three major geothermal fields for 650 megawatts of capacity. Other countries, including the Philippines, have recently added significant geothermal output.

Tapping geothermal resources requires procedures similar to those employed for oil exploration and drilling costs are high. The lack of scientific surveys of potential thermal areas is also retarding rapid geothermal development. While geothermal's environmental impacts are considered minor compared to those of other energy sources, they include possible pollution of surface waters and groundwater by non-toxic chlorides, sulfates, and carbonates or silica.

Conventional geothermal resources, which draw steam or hot water from natural underground reservoirs, can be economically exploited only where molten rock lies within 3,000 meters of the earth's surface. Engineers hope to develop technologies by the year 2000 that will enable drilling and heat extraction as deep as 5,000 meters. Scientists are also trying to find ways to use more abundant, lower-temperature water or steam for electricity generation.

Biomass

Wood, organic wastes, and other biomass accounted for approximately 14 percent of total global energy use in 1980. For Nepal, Ethiopia, and Tanzania, more than 90 percent of their total energy comes from biomass.

Unlike fossil fuels, biomass is a widely available resource that can be produced renewably with good management practices. Biomass can be converted to alcohol, which is an efficient clean-burning fuel for cooking or transportation, or can be burned to generate electricity. Its low-sulfur, low-ash content makes this biomass a cleaner feedstock than coal. Moreover, its production and conversion are inherently labor-intensive, an attractive feature for developing countries facing severe unemployment problems. But the low efficiency of photosynthesis requires huge land areas for energy crops if significant quantities of biomass fuels are to be produced.

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Several countries have expanded their use of biomass for electricity generation since the 1973 oil embargo. The Philippine government wants to build a 3-megawatt base-load, wood-fired power plant for each of the country's 100 rural electric cooperatives. Beginning in 1977, it identified parcels of marginal and unused federal land for 100-hectare wood plantations that are rented to groups of farmers. The National Electrification Administration provides loans for the cooperatives to build the power plants and for the farmers to plant the trees. Program managers estimate that the wood-fired electricity will cost 5.6 cents per kilowatt-hour, about 34 percent less than the marginal cost of electricity in 1981.

The Philippine plan originally called for 114 megawatts of capacity by 1985, but technical problems and budget constraints limited progress. Capacity reached only 12.7 megawatts in 1984, and about three-quarters of the original plantations failed because of poor site selection and late planting caused by bureaucratic delays. Program managers now hope for 200 megawatts of capacity by 1990.

Wind Power

Wind energy machines contributed little to the global energy budget a decade ago, but more than 50,000 units have been installed since the mid-1970's. Most machines are located at "wind farms" where clusters of small turbines line mountain passes and are connected to the electrical grid.

Wind-turbine developers have reduced average per-kilowatt costs from $3,100 in 1981 to less than $1,200 in 1986. Some turbines cost only $1,000 per kilowatt, and wind industry officials predict average costs will fall to about $700 per kilowatt within three to five years. Wind farms have also been built in Denmark, India, and the Netherlands while planning continues in Great Britain, Mexico, Spain, Sweden, and several islands in the Caribbean. Wind availability, of course, varies by region. Relatively few sites possess the average wind speeds of at least 24 kilometers per hour necessary to produce electricity economically. Even in appropriate areas, winds are often intermittent, and turbines tend to operate only about 30 percent of the time compared to about 60 percent for conventional power plants. Moreover, if not connected to an electrical grid, wind systems require expensive and cumbersome storage systems such as batteries, and back-up systems such as diesel engines. Simple mechanical wind machines can also be used for irrigating semi-arid regions where wind speeds average only eight miles per hour. Wind pumps provide particular opportunities for East Africa, northern Argentina, northeastern Brazil, Mexico, and Peru.

Solar Power

Photovoltaics are not yet a significant energy source, but they hold promise of providing electricity under a decentralized system and could have broad applications in the future. One of the major barriers to photovoltaic use has been its high cost. However, this cost has been steadily reduced with improved technology.

Experts believe photovoltaic systems will be installed for $4-6 per watt by the mid-1990's. That price is competitive with small diesel generators used throughout developing countries and in rural areas of industrialized nations. When that goal is reached, photovoltaics could compete for the multi-megawatt market in rural areas that now have little or no electrical service.

The use of renewable energy sources for power generation must be examined on a case-by-case basis. Indigenous renewable resources provide an option for small power generating facilities which are ideally suited for rural areas. Although there is considerable potential for these routes, they have been largely ignored by electric power planners in most developing countries.

o New Power Generation Technology

There are numerous advanced technologies which have been developed by the industrialized nations to produce electric power more efficiently and to reduce the environmental impact of power generation. These should be considered by the developing countries in planning for additional power generating capacity. Some of these new technologies offer the developing countries an opportunity to increase the use of their indigenous coal resources, thereby reducing their reliance on imported fuels.

Cogeneration, which is the simultaneous production of electric power and useful thermal energy, is a generating option that has not been fully utilized in the developing countries. In a conventional thermal power plant, fuel is burned to produce high-temperature, high-pressure steam that is then passed through a turbine to generate electricity. Even in the most efficient thermal steam power plants, less than 40% of the available energy contained in the fuel is converted into electricity. More than 60% of the energy in the fuel escapes to the atmosphere. Some of this thermal discharge is in the combustion gases that escape to the atmosphere through the boiler stack. But most of the waste heat is accounted for by the condensation and cooling of steam and water after they have passed through the turbine. The turbine discharge contains substantial amounts of useful heat, but this heat is at temperatures and pressures that are too low to economically

generate additional electricity. Most commercial and industrial applications, however, require process steam and heat at low temperatures. Therefore, combining the production of electricity and heat in an industrial plant or at a commercial site can use the otherwise wasted energy. The cogeneration option will increase the overall energy efficiency and reduce the need for capacity expansion by the electric utilities. A recent analysis (5) of cogeneration potential in the developing countries indicates that this option could result in a ten percent increase in electricity production.

New techniques such as fluidized-bed combustion, furnace limestone injection, and coal gasification offer dramatic environmental improvements over conventional coal-burning power plants. For countries with coal deposits, these technologies provide means to meet rising electricity demands while mitigating concerns over increased acid rain and other air pollution.

In atmospheric fluidized-bed combustion, coal is mixed with inexpensive limestone and burned in a bed of solids which is suspended by a flow of air. The limestone reacts chemically with the coal to capture most of the sulfur. Because the unit operates at lower temperatures than conventional boilers, it also reduces the emission of nitrogen oxides. The fluidized-bed combustor is also a versatile technology for coal burning in that high ash and poor quality coals can be easily processed. A more advanced version is the pressurized fluidized-bed combustor, in which hot pressurized combustion gases power a turbine. While industries have used atmospheric fluidized beds for years, the pressurized combustor for large scale power generation is not yet commercially developed.

Attempts to capture sulfur dioxide by injecting limestone into a furnace date from the 1960s, but only recently have advancements made the procedure effective. In this process, dry pulverized limestone is fed into the furnace, where it is reduced to lime and reacts with sulfur dioxide to form dry, solid calcium sulfate. Because these reactions occur most effectively at reduced temperatures, the process also suppresses the formation of nitrogen oxides.

In an integrated gasification combined cycle system, coal is converted via air and steam into a clean gaseous fuel. The fuel gas is then combusted in a gas turbine which drives an electric generator. The combustion gases which exit the gas turbine are used to generate steam to produce additional electricity. These combined cycle systems take advantage of advanced gas turbines which have energy conversion efficiencies of over 50%. These systems can be designed as modular units. In addition to attractive costs, they offer short lead times for planning and commissioning incremental power generating capacity.

Besides being candidates for new generating plants, the above technologies can be used to repower existing plants. Repowering replaces a portion of the original facility and increases the capacity while simultaneously reducing environmental emissions.

Several retrofit technologies have also emerged within the last few years that can be integrated into existing power plants in an effort to improve environmental performance. These include:

- o Advanced Coal Cleaning - techniques involving a combination of fine grinding, flotation, and selective coalescence to reduce the ash and mineral sulfur content of coals prior to combustion.

- o Limestone Injection Multi-Stage Burners - a technology that injects sulfur-absorbing limestone into the fuel-rich "reducing" zone of a pulverized coal burner.

- o Slagging Combustors - devices that can control or remove objectionable sulfur and particulate matter from a coal-derived fuel before it is injected into retrofitted oil or gas boilers.

- o Gas Reburning - a concept that injects a secondary fuel, such as natural gas, above the primary combustion zone to create a fuel-rich region in which nitrogen oxides are converted to harmless products.

- o In-Duct Sorbent Injection - a technique that injects sulfur-capturing sorbents directly into a power plant's ductwork leading from the boiler to the stack.

- o Advanced Flue Gas Cleanup - a variety of innovative scrubber technologies that use chemicals such as copper oxide or elec- tron beam irradiation to improve the effectiveness of pollutant capture.

These technologies, either separately or in combination, not only control SO_2 but NO_x as well. In addition, they produce dry wastes which can be disposed of easily and in an environmentally safe manner. Although the SO_2 reduction potential of some of these technologies is lower than conventional flue gas scrubbing, the levels will likely be sufficient to meet possible future re- quirements for emission reductions at existing plants.

ANNEX E

PROJECT FINANCIAL ANALYSIS

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

PROJECT FINANCIAL ANALYSIS- ANNEX E

I. Introduction

The purpose of financial analysis for the Private Sector Energy Development Project is to determine the value of the project as a self contained entity. Financial analysis is only concerned with determining whether the directly quantifiable monetary benefits from the project are larger or smaller than the project's costs. The broader analysis of indirect, opportunity, and social costs is undertaken in the economic analysis.

Financial analysis for the Private Sector Energy Development Project was conducted for three purposes:

1. To assess the financial returns to A.I.D. resulting from its support in this project.

2. To assess the financial returns and incentives for the private firms who will perform the feasibility studies and other special studies.

3. To assess the expected financial returns to the private power project facilities that will ultimately be operated as a result of this development project.

Specific feasibility studies and private power facilities have yet to be identified, thus this financial review necessarily relies on hypothesized numerical and theoretical analysis. More importantly, it should be noted that the goal of A.I.D. development efforts, such as the Private Sector Energy Development Project, is not to show a positive financial return in and of themselves. Feasibility studies, training sessions, and other special studies do not generate revenue, and thus when they are evaluated in isolation the return is negative (i.e. expected project financial costs exceed financial benefits). Ultimately, the value of such development projects is found in the financial viability of the final private power facilities resulting from the feasibility studies, as well as in any economic benefits to the developing countries (as discussed in Annex C).

II. A.I.D. Financial Analysis

As is common in any foreign aid program that seeks to transfer resources to developing countries, the financial returns to A.I.D. for its participation in the Private Sector Energy Development Project are not expected to cover the costs of the program. In terms of project costs, A.I.D. and other donor agencies will provide an estimated $12 million in funding for the PSED Project. In terms of project revenues, financial

returns for this investment are very limited. The repayment of feasibility study funds by successful private sector participants are the only expected project revenues, estimated at $1 million or less. Unless other arrangements are approved, these reflows will be made to the U.S. Treasury and not to the Fund.

For its $12 million investment, the A.I.D. and the other funding agencies will receive an estimated 25 feasibility studies, 6 host country energy assessments, 6 training workshops, 8 study tours, 10 technical assistance trips, and an energy database. While these studies will lead to viable private power facilities in the future, they are not revenue generators for A.I.D. in and of themselves. If 1/5 of the 25 feasibility studies end in successful projects, the U.S. Treasury would recover about $1 million in repayment. This assumes that the average cost to A.I.D. of each feasibility study will be $200,000. The negative payback precludes the calculation of net present values or internal rates of return.

III. Feasibility Study Financial Analysis

Given a normal economic incentive structure, private sector firms would not undertake a series of feasibility studies without the expectations of positive financial returns over the long-term. While the private sector firms will receive zero revenue from the feasibility studies themselves (except for A.I.D. grants), it is the expectation of financial returns from successful private power construction projects that makes these feasibility studies financially viable. (The operating viability of the private power facilities themselves is discussed in the next section). The A.I.D. fund provides further incentive to the private sector to investigate the feasibility of private power facility projects. (Under its cost sharing approach, the Feasibility Fund would provide 50% of the cost of the feasibility studies.)

Table 1 below depicts the expected outcomes of the Private Sector Energy Development Fund. In the initial phase, it is estimated that requests for studies will generate some 75 proposed feasibility studies over the 1989-1994 period. The feasibility fund administrators will then review these proposals for funding. This review stage will act as an initial project hurdle, in that only the most viable proposals will receive funding. (The criteria for funding the projects will include: highest projected NPV, strength of financing and bank commitments, the project country's willingness to support the project, fuel supplier and power distributor commitments, and environmental concerns). Here we estimate that 1 out of 3 private sector proposals will be funded, allowing for 25 funded feasibility studies.

During the feasibility study phase, the private sector firms will perform extensive analysis aimed at making a "go" or "no go" decision on the proposed project. A.I.D. and matching private sector funds will be used during the feasibility stage for many purposes, including specifications and drawings, construction cost estimates, risk analysis, demand forecasting, funding options, environmental analysis, technical analysis, and overall financial planning. The feasibility study stage will serve as a second hurdle for project acceptance -- many projects will be rejected. It is estimated that only about 1/5 (5 out of 25) of the feasibility studies will result in a "go" decision. It is estimated that the PSED project will act as a catalyst for an investment of $500 million of private capital in five or more power plants with a total capacity of 500 megawatts.

Thus, to the extent that revenues from these 5 successful utility plants provide an adequate return to the private firms, the benefits from the initial 25 feasibility studies should outweigh the costs. Table 2 presents one possible scenario for the project:

TABLE 2: EXPECTED VALUE OF PSED PROJECT

	Unit Value	Total Value
75 Proposed Studies	($25,000) each	($1,875,000)
25 Feasibility Studies	($200,000) each	($5,000,000)
5 Successful Projects	$5,000,000 profit each	$25,000,000
		$18,125,000

As suggested by the scenario presented in Table 2, if the PSED fund generates 5 successfully constructed projects with a profit (in present value terms) of $5 million each, then the overall value of the PSED project would be an estimated $20.125 million. (This assumes that firms spend $25,000 for each proposed study or pre-feasibility study.) Note that under the assumptions of Table 2, each of the five successful utility plants needs to have a lifetime present value profit of only $1,375,000 to cover the initial costs of the PSED fund.

IV. Private Power Facility Financial Analysis

The bottom line as to whether the PSED Project is financially viable and successful, either for A.I.D. or the private sector firms, depends on the operating viability of the private power facilities constructed as a result of the project. Electric utilities in developing countries tend to be state controlled and inefficient. Most do not generate enough revenue to cover their operating and capital investment expenses. The poor financial state of many electric utilities in developing countries is due to several factors, including:

1. Electricity rate ceilings that set the marginal revenue from an additional kWh below its marginal cost of supply,

2. Bureaucratic management, where employee-to-customer ratios are much higher than private sector plants due in part to political pressures to hire,

3. Inefficiencies in the areas of technology used in production methods and delivery.

While private sector profit incentives should be able to correct the last two problems, more economic pricing policies (that allow revenues to cover costs) are required to make operating such utilities financially viable for private sector firms. In the interim period, cross-subsidies to the private sector facility operator may allow a government to slowly adjust its electricity pricing tariffs.

The following examples from projects in Pakistan and Guatemala bring out the need for more sensible pricing policies:

Guatemala's National Electrification Plan

A.I.D. efforts in support of Guatemala's National Electrification Plan is now approaching Phase III -- the goal of which is the construction of sub-transmission and distribution lines to rural villages. While the project is worthwhile in that it provides extensive economic benefits to rural Guatemala, the project paper's financial analysis concluded that the Project's financial costs exceeded its financial benefits, with the main reason being the low level of the electricity tariff to small users. Thus the additional sales from the project provided little or no additional revenue to cover costs.

Pakistan's Private Power Project

While Pakistan has been active in involving the private sector in energy development through its Private Power Project initiative, it has also experienced problems

in the pricing of its electricity. Proposals to the Government of Pakistan for private power generation plants are being delayed because the Government has been unwilling to pay an electricity price high enough to make the projects financially viable. This is due in large measure to the long tradition of under pricing electricity and using cross subsidies to finance utility revenue shortfalls.

The examples of Guatemala and Pakistan show that private sector utility plants will only be financially viable if revenues are allowed to cover costs. Ultimately, only confidence among private sector firm's that they can cover such costs in the construction of developing country utility plants will lead to private initiatives and financing in this area. Governments in developing countries must either be willing to price electricity to cover its generating and distribution costs, or to provide cross-subsidies to the private power facilities if below cost tariffs remain in effect.

V. Conclusion

The financial returns to performing a feasibility study in and of itself are negative -- there is a cash outflow without any incoming revenue stream. However, over the long term, the returns to the PSED feasibility studies will be positive if, as expected, they lead to the successful construction and operation of private power projects in developing countries.

ANNEX F

PROJECT ECONOMIC ANALYSIS

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

PROJECT ECONOMIC ANALYSIS- ANNEX F

I. Introduction

The purpose of economic analysis for the Private Sector Energy Development Project is to determine whether the project will be a worthwhile investment for the affected countries. The analysis estimates whether the outputs from the project are sufficiently valuable so as to cover the project costs. Economic analysis differs from financial analysis in that it examines the full effects of a project on a country's economy. While financial analysis examines only the explicit monetary costs and benefits of a project, economic analysis examines hidden opportunity costs and benefits to using resources in such a way. The general principle of economic analysis is to compare the real benefits of a project to its real costs.

In performing the economic analysis for the Private Sector Energy Development Project, it must be recognized that because the project limits its funding to feasibility studies, training, and technical assistance, no specific actual projects can be analyzed. Additionally, among these funded items, it is not realistic to attempt to quantify the economic benefits of the training sessions, seminars, and technical assistance. Although these items may provide long term benefits in areas such as tariff restructuring, there is no way to quantify these benefits. Thus the economic analysis focuses on the expected economic benefits of the feasibility studies.

As was done in the Financial Annex, the economic analysis uses estimates of the number of successful projects resulting from the feasibility studies to gauge the economic viability of the Fund. The following analysis first discusses the broad economic and social benefits expected to result from feasibility fund initiatives. These benefits are then quantified in a return on investment analysis.

II. Project Outputs and Benefits

1. Projects Outputs

The major anticipated long-term output of the project is additional electricity in developing countries. In the financial analysis, it was estimated that of an expected 75 proposals for feasibility study funding under A.I.D.'s Private Sector Energy Development Project, 25 (or about 1/3) would be granted funding.

Additionally, from these 25 feasibility studies, it is estimated that the project will eventually act as a catalyst for an investment of some $500 million of private capital for new generating capacity or major rehabilitation in five or more

power plants ranging from 20 to 200 MW, with a total capacity of 500 MW. The electricity generated will provide many additional benefits to developing countries.

2. Benefits of Electric Power

As discussed in the body of the text, the major impetus for the Private Sector Energy Development Project is the excess and rapidly growing demand for electric power in developing countries. The combination of high growth rates in industrial output, inefficient utility management policies, and inadequate pricing policies in many of these countries has caused the demand for electric services to rise more rapidly than supply. Many countries now face power shortages of over 10 percent of their generation capability.

POWER GENERATION SHORTAGES

Country (at peak)	Shortage, Demand minus Supply
Dominican Republic	15+ percent
Sierra Leone	10 percent
India	10 percent
Pakistan	25+ percent

As a result of such power shortages, local industry must face periods of load shedding, use private and comparatively expensive diesel generators, and adjust production with night shifts and other methods. Thus there is a strong relationship between electric power generation and the economic development of a country-- and a high cost to power shortages. PSED Project feasibility funds would benefit countries by reducing the cost of these power shortages and load shedding.

In addition to problems faced by industry in countries where electricity must be rationed by load shedding, much of the population of these countries remains without electric power. As the following chart for a selection of countries with data available shows, the complete lack of electrical services is particularly acute in rural areas:

PERCENT OF POPULATION WITHOUT ELECTRICAL SERVICE

Country	Total	Rural
Costa Rica	25%	55%
El Salvador	60%	89%
Guatemala	75%	93%
Honduras	70%	95%
Egypt	54%	81%
Pakistan	69%	85%
Phillipines	72%	93%
Sudan	74%	NA

For residents of these and other countries who live without electric power, the benefits of electricity are many. Not only would cheaper electric power replace candles, gas generators, and batteries for these residents, but major economic benefits would be forthcoming in the areas of health care, education, agriculture, and industry. Economic multiplier effects would further increase these benefits.

3. Relationship Between Economic Growth and Electricity Use

Over time, there is a strong correlation between the economic growth rate in a country and its use of electricity. Electricity has a large role in a country's development process, (although cause and effect relationships are hard to establish). From 1970 to 1980, GDP in developing countries grew at about 3.5-5.5 percent per year, while total energy consumption use grew by 5.9 percent and consumption of modern energy forms, i.e. electricity, grew about 7 percent annually.

Economic growth in many developing countries is constrained by shortages of electric power, as mentioned above. With each 1 percent increase in GDP corresponding to a 1 to 2 percent increase in energy use and electricity use, power shortages can be a major impediment to economic growth. (The use of modern energy forms such as electricity tend to grow faster than GDP as more productive uses for energy replace unproductive ones. Electric stoves may replace wood stoves, for example.) While it is unrealistic to attempt to measure the effect that the PSED Project will have on overall GDP growth rates in developing countries, past evidence suggests that any additional electricity generated as a result of the project will lead to additional economic growth.

III. Quantifying the Economic Benefits

The results of the economic analysis suggest that the Private Sector Energy Development Project is a viable economic investment. However, because the PSED Project will be used to fund feasibility studies for potential developing country

utility projects, no specific projects or countries can be examined to determine the economic benefits of the PSED project. (Such analysis, however, will be conducted as part of the analysis of potential projects to receive funding.) Conservative estimates of the economic benefits of the feasibility study funds can be made.

1. Economic Cost of Power Shortages

The major requirement needed to estimate the economic returns to building an electric utility generation plant in a developing country is an estimate of the opportunity cost of the power shortages, load shedding, and total lack of electricity mentioned above. While few studies have attempted to estimate the incremental benefits in health care, education, agriculture, and other areas, extensive work has been done to estimate the cost of load shedding and shortages. This work focuses on the efficiencies gained with electric power when compared to the use of candles and expensive gas generators, and the general loss of production in an economy. Exhibit F-1 presents estimates of the cost of power shortages in selected developing countries. Note in particular that the range of the estimates is well above the average price of a kWh of power generated with electricity (about 8 to 12 cents). The estimates of the cost of power shortages from Exhibit F-1 are the key to assessing the economic benefits of the PSED Fund. Every additional kWh of electricity produced as a result of the PSED Project will save industries and households the cost of a shortage. (Note that in Exhibit F-1, the range of estimates is from $0.06-$6.00/kWh. For the analysis that follows, an estimate of $0.50/kWh or $500/MWh is used for the cost of a shortage. This is conservative in that it is at the low range of the estimates from Exhibit F-1, and the numbers in the Exhibit F-1 are in 1978 dollars.)

2. Discount Analysis of PSED Benefits

In order to determine the economic benefits of the PSED Project, a discounted cash flow analysis was performed. The economic benefits of the Private Sector Energy Development Project are found not in the feasibility studies per se, but in the successful projects generated from these studies. This analysis assumes that the feasibility studies generate five successful plants with a total capacity of about 500 MW. Additionally, financial estimates for the private investment dollars required to build and operate the utility plants, as well as the revenue received from these plants, are left out of the analysis. Here it is assumed that in financial terms these plants would have to project a viable return on investment or the private firms would not build them to begin with. (Given this assumption, the financial NPV for these plants would be and can be removed from the economic analysis).

Using these assumptions and an opportunity (shortage) cost estimate of $500/MWh from Exhibit F-1, Exhibit F-2 presents an analysis of the economic benefits that can be attributed to the successful power plants resulting from the feasibility studies. (Note that this analysis does not attempt to quantify benefits from improvements in health care, education, and other social areas).

The steps and assumptions behind the analysis are as follows. First we assume that plants with a total capacity of 500 MW are constructed. Next, using a plant factor (utilization) of 40% and multiplying by 24 hrs/day and 365 days/year, we estimate the total generated electricity per year at 1,752,000 MWh. We then assume that only half of this new generation is used for shortages and that losses from generation to distribution are 15%. Finally, we value each MWh of newly distributed electricity at $500/MWh (from Exhibit F-1). This produces an estimate of the economic benefits per year -- which can then be projected out over the life of the project and discounted back to arrive at a net present value.

3. Results

This analysis suggests that the economic returns to the PSED Project are positive and that the project is economically viable. The economic NPV for the project under this scenario is estimated at $805 million dollars, with an economic internal rate of return of 57%.

Analysis was also performed to test the sensitivity of these results to the estimate used for the cost of unserved energy. Exhibit F-2 presents this sensitivity analysis. Note that the project NPV is positive all the way down to an estimated cost of unserved energy of $8/MWh -- while studies suggest that this cost is in the range of $500/MWh or higher.

Costs of Power Shortages in Selected Developing Countries (1978 US$)

Country	Sector(s)	Type of Shortfall	Cost of Shortage
Bangladesh	All	Unplanned outages	1.00$/kWh
Brazil	Households	Unplanned outages	1.95-3.00$/kWh
Chile	Households	Unplanned outages	0.53$/kWh
	Industry	Unplanned outages	Range: 0.25-12.00 $/kWh Central Tendency 1.50-6.00 $/kWh
Costa Rica	Households	Unplanned outages	-
Egypt	Industry	Unplanned	0.40 $/kWh
India	Industry	Controlled load shedding	Annual cost ranges from 1 to 3% of GDP (1.5 to 3 billion dolars annually)
Jamaica	Industry	Unplanned outages	1.25 $/kWh
Pakistan	Industry	Controlled load shedding	Range: 0.26-1.77 Average: 0.46 $/kWh
		Unplanned outages	Range: 0.36-2.54 Average: 0.81 $/kWh
		Controlled and Uncontrolled load shedding	$350 million in 1984-85
Paraguay	Residential		-
Taiwan	Industry	—	0.06-2.16$/kWh
Tanzania	Households		0.50 $/kWh
	Industry		0.70-1.40 $/kWh
	Commercial		1.00 $/kWh
	All sectors		0.70-1.10 $/kWh

Source: Oak Ridge National Laboratory, "The Impact of Inadequate Electricity Supply in Developing Countries", January 1988.

EXHIBIT 2

ECONOMIC BENEFITS FROM FEASIBILITY FUND

DISCOUNTED CASH FLOW ANALYSIS:

YEAR	ECONOMIC BENEFITS (millions)	FEASIBILITY FUND COST (millions)	NET BENEFITS (millions)	NET DISCOUNTED BENNEFITS (millions)
0	$0	($12)	($12)	($12)
1	$0	$0	$0	$0
2	$0	$0	$0	$0
3	$0	$0	$0	$0
4	$0	$0	$0	$0
5	$0	$0	$0	$0
6	$0	$0	$0	$0
7	$0	$0	$0	$0
8	$0	$0	$0	$0
9	$0	$0	$0	$0
10	$0	$0	$0	$0
11	$573	$0	$573	$123
12	$596	$0	$596	$111
13	$620	$0	$620	$101
14	$645	$0	$645	$91
15	$670	$0	$670	$82
16	$697	$0	$697	$75
17	$725	$0	$725	$67
18	$754	$0	$754	$61
19	$784	$0	$784	$55
20	$816	$0	$816	$50
21	$848	$0	$848	$45
22	$882	$0	$882	$41
23	$918	$0	$918	$37
24	$954	$0	$954	$33
25	$992	$0	$992	$30
26	$1,032	$0	$1,032	$27
27	$1,073	$0	$1,073	$25
28	$1,116	$0	$1,116	$22
29	$1,161	$0	$1,161	$20
30	$1,208	$0	$1,208	$18
			NET PRESENT VALUE:	$805
			INTERNAL RATE OF RETURN	57%

ASSUMPTIONS:

500	Total Capacity of New Plants Built (MW)
40%	Plant Factor
1,752,000	Estimated MWh of Generated Electricity per Year
50%	New Power Used For Shortages or Load Shedding
15%	Losses From Generation to Distribution
$500	Cost of Unserved Energy at Distribution Voltage ($/MWh)
$372,300,000	Economic Benefits Per Year
4%	Inflation Rate
15%	Discount Rate

SENSITIVITY ANALYSIS:

Cost of Unserved Energy ($/MWh)	Net Present Value (millions)
$500	$805
$250	$396
$100	$151
$50	$70
$25	$29
$10	$4
$8	$0
$5	($4)

NOTES:

1). The costs for building the plants and generating the electricity are not included in this analysis, because it is assummed that if a private sector firm is to make such an investment, its revenues would exceed its costs and the financial NPV would be >0.

2). The estimate for the cost of unserved energy is conservative, in that it is at the low end of the range of estimates in Exhibit C-1.

3). No benefits are received until year eleven, when plants are expected to come on line.

4). The estimate for the percent of power going to areas of shortage and load shedding is also conservative. Unless electricity demand abruptly stops growing, 100% of the generated electricity will probably be needed.

5). The estimate for plant factor is conservative, and assumes a mix between baseload and peaking or hydro.

6). The estimated percent of power lost from generation to distribution is at the high end of most estimates.

ANNEX G

PROJECT SOCIAL SOUNDNESS ANALYSIS

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

SOCIAL ANALYSIS- ANNEX G

The power supply problem has adversely affected the social and economic development of many developing countries. Social programs are constrained not only by the lack of reliable electricity available to them, but also by loss of development funds which the government must divert from social programs to the power sector development. Private investment in the power sector will provide alternative forms of financing for the development of the power sector and will improve the reliability and availability of electricity.

Specifically, an improved power supply should increase the amount of power available for education, health care, agriculture, and industry. The A.I.D. Report to Congress on Power Shortages in Developing Countries addresses areas in which electricity can improve socioeconomic conditions. Some examples include:

1) Education. Electricity is associated with information transfer, classroom conditions, and study habits. For instance, studies have found that children who can read by electric light spend more time reading at home than those who lack electric light.

2) Vaccination. Vaccines for many human and livestock diseases require refrigeration. The total annual worldwide losses from diseases that could have been prevented by vaccination if refrigeration were more widely available are probably in the billions of dollars. Although refrigeration can be provided through non-electric technologies, expansion of electric refrigeration would simplify the effort.

3) Political Stability. Development, rather than electrification, is the key to building support for a government or political system. It is clear from anecdotal evidence, however, that failure to maintain reliable electricity services and acceptable prices of electricity for existing users can result in general public dissatisfaction.

In addition to the direct benefits of an improved power supply, social programs will also benefit as governments are able to free up funds and resources from their power sector development programs and focus more resources on the development of education, health care, and other critical social programs.

Furthermore, the expansion of the power supply should have a substantial impact on employment. The power sector, clearly, will experience an increased need for managers, and skilled and unskilled labor. In addition, increased power available for industrial and business uses should produce a considerable number of employment opportunities. Increased employment and productivity can have a significant effect on individual income levels and gross national product.

1. Impact on Women

The project is unlikely to have significant direct impact on the development of women in developing countries. However, it will foster improved living and working conditions through the power supply improvements it promotes. Specific impacts will be seen in employment opportunities, living conditions, and the overall standards of living.

Although the most direct impact on employment will be felt by males, who are the dominant labor force in the power sector, other employment opportunities should arise for women in secondary industries which are attracted to new power plant sites and in other areas which benefited from the availability of electricity. One area specifically targeted to attract women is the microenterprise, a small business which relies on electrical machines and appliances to function. Current efforts are being made to promote the growth of these small businesses and the availability of reliable and affordable power should further encourage their development.

Reliable power will definitely have a positive effect on the living and working conditions of women. For instance, in the home, additional power will be available for preparing food, heating and cooling the home, and using other labor saving devices. For women who live on farms, additional power can also be used for irrigation to relieve women of the burden of carrying water to the fields. In addition, many other labor saving devices, made available through reliable and affordable energy, will have positive long term effects on the development of women.

Through improvements discussed above and the strengthening of the economy that result from the project, the standards of living for households will improve. Women will benefit, for instance, from the increased family income which enhanced employment opportunities provide. Overall, the project should strengthen the conditions and development of women.

ANNEX H

PROJECT ADMINISTRATIVE ANALYSIS

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

PROJECT ADMINISTRATIVE ANALYSIS- ANNEX H

Careful evaluation and analysis was made during the preparation of the PSED Project Paper to ensure that proposed project activities would not present an unnecessary administrative burden on A.I.D. Missions, the Bureau for Science and Technology, or the geographic Bureaus.

Implementation of the PSED Project, as proposed will not have any unusual requirements for A.I.D. administrative support capabilities. The PSED Project will be managed by the Office of Energy, which will provide centralized project supervision and a mechanism for dissemination and interpretation of project results as needed in the broader A.I.D. policy and programming process. The Project Director and core project staff for the PSED project will report to the A.I.D. project manager appointed by the Office of Energy.

The PSED Project, as proposed, will affect Mission workloads and may possibly affect staffing requirements. However, this will tend to be minimized since the core staff and consultants will have considerable experience at operating within the A.I.D. administrative system and have worked in many of the target countries previously. Project support services on the part of participating Missions are generally expected to be minimal. It is expected that this project can be successfully implemented and managed given present staffing levels within the Office of Energy.

ANNEX I

PROJECT ENVIRONMENTAL ANALYSIS

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

PROJECT ENVIRONMENTAL CONSIDERATIONS- ANNEX I

1. Impact of Power Generation Facilities

One objective of the energy development projects in the developing countries is to promote the use of innovative, yet proven, technologies which can more efficiently utilize energy resources with reduced environmental impacts. The industrial countries of the world have only recently, within the last 25 years, recognized the adverse impacts of electric power production on environmental quality and human health. The projected expansion of electricity generation in developing countries could therefore pose serious environmental problems in these areas unless appropriate measures to mitigate such impacts are incorporated in the planning and implementation process.

The construction of power generating facilities will impact the air, water, ecological, and social resources of the host country. The significance of these impacts will depend on the type of power plant installed and on the local environment. The type of plant and its associated energy source, e.g., coal, oil, gas, or hydro, will dictate the magnitude and nature of pollutants discharged to the environment. For example, use of high sulfur coal will result in higher atmospheric emissions than if the plant was fired by natural gas. Secondary effects which impact on the social, health, and safety aspects are associated with development of natural resources for use by the power plant. Examples include coal mining, dam construction for hydropower, and diversion of water from agricultural sources. The local environment factor depends on the ability of the area to assimilate the effects of the physical plant, including its pollutant discharges and social demands such as employment and civic services.

The potential impacts of electric power projects on the specific resource areas are as follows:

Air Resources - The principal considerations with air quality are concerned with the potential emissions of sulfur dioxide, nitrogen oxides, and particulate matter. These are directly related to the general issue of "acid rain" and its detrimental effects on human health as well as animal and plant life. One estimate (1) projects that, without extensive use of technologies to control sulfur dioxide emissions from the expanding power sector, total sulfur dioxide discharged into the atmosphere will triple over the next 20 years.

Another issue is the global concern over the "greenhouse effect" resulting from the increasing levels of carbon dioxide in the earth's atmosphere. The potential climatic changes associated with a rise in global temperature are

predicted to worsen with the continued burning of fossil fuels.

Although the contributions of the developing countries to worldwide degradation of air quality are expected to be small compared to those of the industrialized nations, appropriate actions to minimize such contributions should be encouraged.

Water Resources - Electric power projects involve the consumptive use of water for cooling purposes and for plant service requirements. The other aspect is related to the discharge of contaminated and heated water to the environment.

Where fresh water supplies are limited, the overall plant water requirement must be fully evaluated during the feasibility phases of the project. The use of dry cooling systems, once-through cooling systems using sea water, and recirculating water systems must be considered during the plant design.

Potential water discharges from power projects include cooling system blowdown; boiler feed water blowdown; demineralizer back wash and resin waste waters; ash transport waste water; runoff from ash and coal storage piles; and normal storm drainage from the site area. Several of the large waste water streams are relatively clean, e.g. cooling system and boiler blowdown, and can either be discharged to a surface body of water with minimal effect or recycled in the plant. Other streams can economically be handled using evaporation ponds. In the case of oil fired plants, the potential for spillage into surface waters will require a design for total containment.

Ecological Resources - The potential ecological impacts of power projects include the removal of habitat by plant construction, effects of air pollutants, entrapment of aquatic organisms in cooling systems, and effects of transportation systems. The significance of such impacts depends on the specific plant design and the ecological systems affected.

Socio-economic Resources - As a result of increased electric power, social development will benefit through increased industrial and agricultural activities. However, socioeconomic impacts will occur from changes in land use, employment and economic shifts, increases in the demand for facilities and social services, increases in the use of transportation systems, and losses of cultural, historical and archaeological resources.

2. Environmental Guidelines

Unlike the United States and other industrialized nations, the developing countries do not have standards and policies in place for environmental management. However, some of these countries are in the process of establishing such policies. For instance, the Pakistan Environmental Ordinance of 1983 initiated a mechanism for establishing a national environmental policy including the development of air and water quality standards. While no standards have yet been adopted, proposed standards to restrict the discharge of pollutants into the atmosphere and water have been drafted.

In the absence of specific environmental regulations for power plant projects in the developing countries, it would be appropriate to use the guidelines established by the World Bank. Table 1.0 lists the applicable criteria which were developed from the World Bank guidelines, together with technological considerations, and drafted for private sector power projects in Pakistan (2).

The air emission criteria are listed for fossil fuel fired plants, gas turbines, and diesel engines. For the steam electric facilities, the criteria can generally be achieved with good combustion practices and without pollution control equipment. Coal fired plants would likely be required to install either an electrostatic precipitator or a baghouse filter to control particulate matter, as well as low NO_x burners. The use of high sulfur coal may also require a sulfur dioxide removal system. The limits specified for gas turbines reflect the actual type of fuel used and good operational practices.

Ambient air quality limitations reflect the protection of the health and welfare of the general public. These were based on World Bank standards and are consistent with the World Health Organization criteria.

Table 1.0

Environmental Criteria for Electric Power Plants

AIR EMISSIONS

1. Fossil Fuel Fired Steam Generators:

   - o Sulfur dioxide - 454 MT/Day/Plant (rural areas)
     - 91 MT/Day/Plant (rural areas)
     - Maximum concentration in stack gas should not exceed 5,000 mg/m^3
   - o Nitrogen oxides - 0.6 lb/million BTU
   - o Particulate matter - 150 mg/m^3 in stack gas (rural)
     - 100 mg/m^3 in stack gas (urban)
     - Visible emissions should not exceed 20% opacity

2. Gas Turbines:

   - o Sulfur dioxide - Maximum 0.8% sulfur in fuel oil
   - o Nitrogen oxides - Maximum 200 ppm in stack gas
   - o Particulate matter - Visible emissions should not exceed 20% opacity

3. Diesel Engines:

   - o Particulate matter - Visible emissions should not exceed 20% opacity

Table 1.0 (Continued)

AMBIENT AIR QUALITY

1. Sulfur Dioxide - 100 ug/m^3 annual average
   - 500 ug/m^3 24 hour average
2. Nitrogen oxides - 100 ug/m^3 annual average
3. Particulate matter - 100 ug/m^3 annual geometric mean
   - 500 ug/m^3 maximum 24 hour average

STACK PARAMETERS

1. Stack Height - Minimum stack height is based on the following equation:

   S.H. = 0.9 (H + 1/2L), where:

   H = building height, m

   L = lesser dimension of either the height or width of the largest nearby building, m

2. Stack Velocity - Not less than 15 m/sec.

WATER DISCHARGE

1. No allowable discharge of polychlorinated biphenyl compounds (PCB).
2. No allowable discharge of water used to transport ash.
3. The PH of all aqueous discharges will be within the range of 6 - 9.
4. Maximum total suspended solids - 100 mg/l
5. Maximum oil and grease - 20 mg/l
6. Chlorine concentration - 0.5 mg/l maximum
   - 0.2 mg/l average
7. Thermal conditions of aqueous discharges to surface bodies of water are limited to a maximum of 8° C above the intake water temperature.

Table 1.0 - Continued

LAND/SOLID WASTE

1. Where appropriate, evaporation ponds should be used as much as practical to avoid surface water discharge.

2. Land disposal of oily wastes should not be employed.

3. Sedimentation and erosion control plan must be developed.

NOISE LEVELS

1. Working environment: Maximum 90 dBA for an 8-hour shift. Hearing protection is recommended.

2. At property boundary: 70 dBA average

3. Residential area: 60 dBA day time
   55 dBA night time

Waste water discharges from power plants do not generally contain significant quantities of toxic materials. Consequently, most power plant waste waters can be safely discharged after conventional treatment. The water discharge criteria, therefore, recognize the use of neutralization, sedimentation, and oily water separation technologies.

Toxic materials, such as PCBs, must not be discharged into surface waters. In addition, land disposal of these materials should conform to accepted practices, i.e. in sealed drums and covered with an impervious material such as clay. Incineration of PCBs is the preferred method for disposal. For proper incineration, the processing temperature should be maintained at 1000°C for at least 1.5 seconds.

Any water used to transport bottom ash or fly ash may contain various quantities of toxic heavy metals, such as mercury, arsenic, selenium, and vanadium. Such water streams should not be discharged to the environment. Recycle of these aqueous streams or disposal in evaporation ponds is recommended. Maintenance cleaning waste waters should be neutralized and also disposed of in evaporation ponds. However, the location of evaporation ponds must consider the possibility of contamination of ground water and nearby wells.

Fuel storage should be constructed with an embankment which surrounds the tank for primary containment. The volume between the tank and the dike must be sufficient to hold the full volume of the tank. Primary containment should also be considered around fuel oil handling facilities.

Noise limitations reflect the protection of workers from hearing loss and reducing the potential for the plant operation disturbing the nearby residential areas.

In performing an environmental assessment for a power plant, the potential for secondary effects from land development should be addressed. Social impacts on the people, such as loss of land, must be mitigated and compensation should be made to the displaced people.

3. Environmental Assessment of Power Projects

The issue of environmental impacts for a proposed power plant should be addressed during all phases of project development, from prefeasibility studies to facility construction and operation.

For private power projects, a prefeasibility study is undertaken to decide whether the project is technically and economically attractive. This study phase typically addresses the site selection; fuel type, source, and availability; technology choice; plant size and market potential; preliminary

design and project economics; legal and environmental issues. In this phase of development, a preliminary environmental characterization of the project is made. Basically, this effort identifies the sources of anticipated plant discharges as well as providing estimates of emission quantities, e.g.

- o Plant heat rate and capacity factor.
- o Fuel usage and fuel characteristics.
- o Stack parameters
  - number and location
  - dimensions
  - temperature and velocity
- o Air emission rates
  - particulate matter
  - sulfur dioxide
  - nitrogen oxides
  - carbon monoxide
- o Overall plant water balance
  - specify intake water streams
  - specify aqueous discharge streams
- o Solid waste streams
  - specify type and quantity
- o Facility plot plan
- o Plant staffing requirements

This characterization is used in conjunction with the appro- priate environmental criteria to identify potential problem areas which need further attention as the project proceeds.

After some assurance is given that the project is acceptable, a feasibility study is undertaken to develop the project details. This effort includes engineering designs, equipment specifications and bid packages, detailed cost estimates and financial plans, fuel supply and grid connection plans, project schedules, and environmental mitigation measures.

As a parallel effort with the feasibility study, a baseline environmental characterization is conducted. This activity involves collecting information on the air quality, meteorological conditions, ecology, water resources, and socio-economic aspects of the plant site and surrounding area. This information is used in the feasibility study to determine the potential environmental impacts. As part of this analysis, conformance with ambient air and water quality criteria is assessed, as well as any significant impact to the social and ecological environment. If a potential impact is found to be significant, then design alternatives must be evaluated to

mitigate the effect to an acceptable level.

The feasibility study would disclose the environmental baseline and impact information that was developed for the project. It also would detail the proposed mitigation and monitoring procedures to be used during the construction and operating phases of the project.

4. Literature References

(1) "Power Shortages in Developing Countries; Magnitude, Impacts, Solutions, and the Role of the Private Sector"
U.S. Agency for International Development, March 1988

(2) "Pakistan - Private Sector Power"
Project Paper
U.S. Agency for International Development, August 1988

ANNEX J

COUNTRY ASSESSMENT MATRIX FOR POTENTIAL PRIVATE SECTOR ENERGY DEVELOPMENT

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

Country Assessment for Potential Private Sector Energy Development

AFRICA

	LEGAL SYSTEM	FINANCIAL SITUATION	HEALTH OF ECONOMY	HEALTH OF UTILITY	LEVEL OF INTEREST
Botswana					
Burkina Faso					
Burundi					
Cameroon					
Cape Verde					
Chad					
Cote d'Ivoire					
Djibouti					
Ethiopia					
The Gambia					
Ghana					
Guinea					
Guinea-Bissau					
Kenya					
Lesotho					
Liberia					
Madagascar					
Malawi					
Mali					
Mauritania					
Mozambique					
Niger					
Nigeria					

Key: 1 = Below Average
2 = Average
3 = Above Average

AFRICA (CONT.)

	LEGAL SYSTEM	FINANCIAL SITUATION	HEALTH OF ECONOMY	HEALTH OF UTILITY	LEVEL OF INTEREST
Rwanda					
Senegal					
Sierra Leone					
Somalia					
South Africa					
Sudan					
Swaziland					
Tanzania					
Togo					
Uganda					
Zaire					
Zambia					
Zimbabwe					

Key: 1 = Below Average
2 = Average
3 = Above Average

Country Assessment for Potential Private Sector Energy Development
ASIA / NEAR EAST

	LEGAL SYSTEM	FINANCIAL SITUATION	HEALTH OF ECONOMY	HEALTH OF UTILITY	LEVEL OF INTEREST
Bangladesh					
Burma					
Fiji					
Indonesia					
India					
Nepal					
Pakistan					
Philippines					
Sri Lanka					
Thailand					
Egypt					
Jordan					
Morocco					
Oman					
Portugal					
Tunisia					
Yemen Arab Rep.					

Key: 1 = Below Average
2 = Average
3 = Above Average

Country Assessment for Potential Private Sector Energy Development
LATIN AMERICA / CARIBBEAN

	LEGAL SYSTEM	FINANCIAL SITUATION	HEALTH OF ECONOMY	HEALTH OF UTILITY	LEVEL OF INTEREST
Barbados					
Belize					
Bolivia					
Brazil					
Colombia					
Costa Rica					
Dominican Republic					
Ecuador					
El Salvador					
Grenada					
Guatemala					
Haiti					
Honduras					
Jamaica					
Mexico					
Panama					
Peru					
Uruguay					

Key: 1 = Below Average
2 = Average
3 = Above Average

ANNEX K

PRIVATE POWER CONFERENCE & WORKSHOP AGENDA

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

AGENDA

INTERNATIONAL WORKSHOP ON OPPORTUNITIES FOR PRIVATE SECTOR POWER GENERATION IN INDONESIA

Co-Sponsors:

Ministry of Mines and Energy
&
Agency for Assessment & Application of Technology (BPPT)

Goal:

To enable Indonesia to design and develop a private sector power program.

Conference Objectives:

1. To discuss and evaluate Indonesia's power situation including supply and demand projections, financial and investment situation, and policy and institutional factors that affect private power development.

2. To examine other countries' experiences with private sector power and relate that to Indonesia's experience and opportunities.

3. To examine private sector views and key financial, institutional, and technical issues necessary for development of an Indonesian private sector power program.

Site:

Hotel Borobudur Intercontinental
Jakarta, Indonesia

Dates:

March 6, 7, 8, 1989

Workshop is made possible through the support of the U.S. Agency for International Development. For additional information, please contact: Pirooz Sharafi, RCG/Hagler, Bailly, Inc., 370 L'Enfant Promenade, S.W., Washington, D.C. 20024-2518; (202) 488-1500.

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Day 1 (March 6, 1989)

To discuss and evaluate Indonesia's power situation including supply and demand projections, financing, investment, and policy and institutional factors that affect private power development.

The Indonesian Perspective

Morning

Welcome and Opening Remarks

08:30 - 08:45 am His Exellency Mr. Ginanjar Kartasasmita, Minister of Mines and Energy

His Exellency Mr. Paul Wolfowitz, Ambassador of the United States to Indonesia

Keynote Speech

08:45 - 09:15 am His Exellency Dr. B.J. Habibie, State Minister for Research and Technology

Power Situation in Indonesia

09:15 - 09:35 am Dr. A. Arismunandar, Director General for Electric Power & New Energy, Ministry of Mines & Energy

09:35 - 10:00 am Mr. Ermansyah Yamin, President Director, PLN (National Utility)

The national power situation will be described including supply and demand characteristics, projections for the future and expansion plans.

10:00 - 10:30 am Coffee Break

Financing

10:30 - 12:00 am Speakers from Ministry of Finance, Board of Investment, National Development Planning Agency

Background on Indonesia's financial situation as it relates to the power sector will be reviewed. An overview of the economic and financial conditions faced by the power sector in the country will be given; implications of private sector power development for the national budget, balance of payments and capital market development will be presented.

Afternoon

12:00 - 01:30 pm Lunch

Existing Legislation and Regulations

01:30 - 01:55 pm Speakers from Directorate General for Electric Power & New Energy, Ministry of Mines and Energy

The existing institutional structure of the power sector including the legal and regulatory environment will be examined. The institutional setting for private sector investment, foreign or domestic, in the power sector will be covered.

01:55 - 02:20 pm Dr. Philip Palmedo, Chairman of the Board, Energy Development International, Inc.

Review of a recent study on private power opportunities in Indonesia; identification of key issues to be addressed in workshop: power planning, policy, regulatory, institutional and financing issues.

02:20 - 02:45 pm Mr. Gregory Churchill Attorney, Ali Budiardjo, Nugroho, Reksodiputra

Legal aspects of private investment in power generation activities in Indonesia.

02:45 - 03:00 pm Coffee Break

Panel Discussion

03:00 - 04:30 pm Moderator: Mr. Rahardi Ramelan, Deputy Chairman, Agency for Assessment and Application of Technology (BPPT)

Chairman and selected participants will conduct an open panel discussion highlighting the key issues covered during the day. This session leads to the topic of the next day, "private power."

Day 2 (March 7, 1989)

To examine other countries' experiences with private sector power and relate that to Indonesia's experience and opportunities.

Private Power Options

Morning

Framework for Private Power Generation:

08:30 - 10:00 am Mr. Robert Keegan, Attorney Keohane & DeTore; Dr. Pirooz Sharafi, Manager, RCG/Hagler, Bailly, Inc.

Review of international trends, potential issues and impediments related to private power; regulatory, financial and technical framework for private power programs. Topics include:

(1) Policy and regulatory development.

(2) institutional arrangements, i.e., solicitation/approval of private power projects, power purchase agreement, technical issues.

(3) Financing issues - private investors, multilateral banks and donors.

10:00 - 10:30 am Coffee Break

Panel Discussion: Country-Specific Experiences

10:30 - 12:00 am Moderator: Dr. Wardiman Djojonegoro, Director General, BPPT; Panel members from Pakistan, Philippines, and U.S.A.

Country representatives and private project developers will briefly describe the background leading to policy development for private power and the existing policy/regulatory framework and project development experience. Specific projects in each country will be discussed in detail.

Afternoon

12:00 - 01:30 pm Lunch

Independent Power Projects in Indonesia

01:30 - 02:45 pm Panel Discussion: Indonesia's experience with private power

Moderator: Dr. Zuhal, Director, Non-Mineral Resource; Panel members from: PLN, UNOCAL, Indonesian Electric Cooperatives.

Each representative will describe existing or planned power projects to sell to the grid in Indonesia.

02:45 - 03:00 pm Coffee Break

Private Power Opportunities: Three simultaneous workshops

03:00 - 04:30 pm Workshop I. Gas and Geothermal
Leader: Professor Zen, BPPT.

Workshop II. Coal
Leader: Mr. Sutaryo Sigit, Director General of Mines; Ministry of Mines & Energy

Workshop III. Other Renewables
Leader: Dr. A. J. Surjadi, Director, Ministry of Mines & Energy

Day 3 (March 8, 1989)

- *To examine private sector views and key financial, institutional, and technical issues necessary for development of an Indonesian private sector power program.*
- *To prepare an action plan.*

Morning

Private Sector Program Issues

08:30 - 09:15 am Speakers: Mr. Robert Keegan, Attorney Keohane & DeTore; Dr. Pirooz Sharafi, Manager, RCG/Hagler, Bailly, Inc.

The key financial, institutional and technical problems involved in implementing a non-utility power generation program will be described. The financial issues include contracts and purchase price determination. Technical issues include synchronization, protection and backup power, interconnection and control, distribution losses, dispatching, peaking and scheduling. Issues related to availability and quality of fuel supplies and existing infrastructures will also be covered.

Finance

09:15 - 10:00 am Speakers from International banks, Indonesia Investment Coordinating Board, and Private Banks in Indonesia.

A review of alternative financing arrangements and sources including international banks, local banks and private sponsors.

10:00 - 10:30 am Coffee Break

Panel Discussion - The Role of International Development Organizations

10:30 - 11:30 am Dr. Andres Libenthal, Energy Economist, World Bank; Dr. Robert Ichord, Chief, Energy and Natural Resources, USAID; Dr. James Sullivan, Director, Office of Energy, USAID; also representatives from the Asian Development Bank and the Japense Export/Import Bank.

The IDO's current and future activities in Indonesia and the region will be presented. The potential role for non-utility power generation will be reviewed.

Workshop Conclusion

Summary of Workshop and Program Definition

11:30 - 12:30 pm Moderator: Mr. Alain Streicher, Senior Vice President, RCG/Hagler, Bailly Panelist: Dr. Rahardi Ramelan, BPPT; Dr. A. Arismunandar, Ministry of Mines and Energy; Mr. Paul Walters, Commercial Counselor, U.S. Embassy, Jakarta; Dr. James Sullivan, USAID; Dr. Robert Ichord, USAID.

The conclusions of the conference and workshops will be presented including possible directions for future activities in independent power generation in Indonesia.

Wrap Up & Open Discussion

12:30 - 01:00pm Closing Statements

Adjournment

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Asian Institute of Technology

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ASEAN/AIT/USAID SENIOR EXECUTIVE SEMINAR ON COGENERATION AND PRIVATE POWER

November 9-11, 1988
Hua Hin, Thailand

AGENDA

Wednesday, November 9

1:30 pm	Participants leave by bus from Montien Hotel, Bangkok, and arrive at Hua Hin Royal Garden Resort in the late afternoon
6:30 pm	Seminar Registration
7:30 pm	Reception and Buffet Dinner
9:00 pm	Welcoming Remarks and Opening of Seminar

Thursday, November 10

8:30-8:45 am	Introductory Remarks
8:45-9:25 am	The Environment for Cogeneration and Private Power in ASEAN countries Dr. Wesley K. Foell, Professor, Energy Technology Division, Asian Institute of Technology, Bangkok
9:25-9:45 am	Discussion
9:45-10:25 am	Cogeneration/Private Power Experience and Status in the U.S.: Institutional and Regulatory Perspective Mr. Robert J. Keegan, Keohane and DeTore, Attorneys at Law, Boston, Massachusetts
10:25-10:45 am	Discussion

BREAK

11:15-11:55 am	Cogeneration/Private Power Experience and Status: The Utility Perspective Mr. John W.Rowe, President Central Maine Power Company, Augusta, Maine
11:55-12:15	Discussion
LUNCH	
1:30-2:10 pm	Pricing and Contracting Issues and Experience Dr. Charles C. Cicchetti, Deputy Director, Energy and Environmental Policy Center, John F. Kennedy School of Government, Cambridge, Massachusetts
2:10-2:30 pm	Discussion
2:30-3:10 pm	Electric Utility's Technical Considerations Related to Cogeneration and Private Power Mr. Brian E. Curry, Director of Cogeneration Development, Northeast Utilities, Hartford, Connecticut
3:10-3:30 pm	Discussion
BREAK	
4:00-5:30 pm	Panel Discussions on Day's Topics
7:00 pm	SOCIAL HOUR AND DINNER
Friday, November 11	
8:30-9:45 am	Financing Issues in Implementation of Cogeneration and Private Power Projects Mr. George T. Lewis Jr., President and CEO, Cogentrix, Inc., Charlotte, North Carolina
9:45-10:15 am	Discussion
BREAK	
10:45-12:15 am	Selected Case Studies of Implemented Cogeneration and Private Power Projects: Industrial and Developer Perspectives Discussion Mr. Walter P. Smith, Manager, Energy Efficiency and Conservation, BASF Corporation, Charlotte, North Carolina Mr. George T. Lewis Jr., Cogentrix, Inc.

OFFICE OF ENERGY AFFAIRS

and

USAID Project on Technology Transfer for Energy Management (TTEM) with Resource Support from Office of Energy, Agency for International Development

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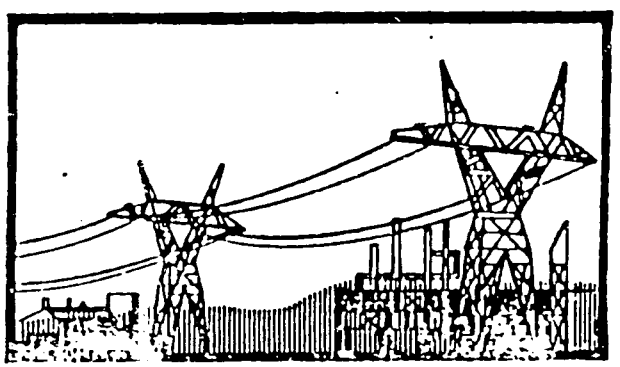
PHILIPPINE CHAMBER OF COMMERCE AND INDUSTRY

Present a seminar on ...



PRIVATE POWER GENERATION THROUGH BUILD-OPERATE-TRANSFER

Manila Hilton Ballroom A

October 5, 1988

K-7

P R O G R A M M E

7:45 - 8:30	Registration	
8:30 - 8:35	Welcome Remarks	Mr. Tristan Calasans Chairman, Energy Committee Philippine Chamber of Commerce and Industry
8:35 - 8:50	Keynote Address	Hon. Catalino Macaraig Jr. Executive Secretary
8:50 - 9:05	Keynote Address	Mr. Malcolm Butler Mission Director US Agency for International Development
9:05 - 9:20	Keynote Address	Mr. Victor Lim President Philippine Chamber of Commerce and Industry
9:20 - 9:50	Coffee Break	
9:50 - 10:00	"The Power Crisis: A Role for BOT?"	Dr. Alberto J. Sabadeil Deputy Director Office of Energy, USAID
10:00 - 10:30	"The BOT Concept" and Introduction of Resource Persons	Dr. Ernest Y. Lin Technical Director AID Conventional Energy Technical Assistance Project
10:30 - 11:00	"Independent Power Generation and Electricity Market Structure- A California Regulator's Perspective"	Mr. Donald Vial Commissioner Public Utility Commission California
11:00 - 11:15	Open Forum	
11:15 - 11:45	"A Utility Perspective in Purchasing Power From Third Party Projects"	Mr. James K. A. Harral Assistant Vice President Power Planning and Contracts Pacific Gas and Electric Company
11:45 - 12:00	Open Forum	
12:00 - 1:00	Lunch	
1:00 - 1:30	"The Turkish BOT Power Project Experience"	Mr. William E. Stevenson Vice President Bechtel Financing Services, Inc.
1:30 - 1:45	Open Forum	
1:45 - 2:15	"Privatization Within the Power Sector - A Contractor's View on the Development and Risk Issues"	Mr. Jerry M. Fargo Vice President and Director International Business Development and Sales Combustion Engineering, Inc.
2:15 - 2:30	Open Forum	
2:30 - 3:00	Coffee Break	
3:00 - 3:30	"The Bankers Perspective"	Mr. William Dykes Vice President and Managing Director Citicorp International, Ltd.
3:30 - 4:15	Open Forum	
4:15 - 4:30	Closing Remarks	Atty. Wenceslao B. dela Paz Executive Director Office of Energy Affairs

LUNCH	
1:30-3:00 pm	Panel Discussions
BREAK	
3:30 pm	Country Panel Discussions Recommendations
5:00 pm	Closing

ANNEX L

LIST OF INTERVIEWS FOR PSED POJECT PAPER

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

LIST OF INTERVIEWS

The following is a list of interviews conducted by the Price Waterhouse team at other A.I.D. Bureaus and at other government and non-government agencies.

Name	Organization	Date of Interview
William Reynolds	Contracting Office- A.I.D.	11 October 1988
Gary Bisson	General Counsel's Office- A.I.D.	18 October 1988 25 October 1988
Joseph Fishcer	OPIC	25 October 1988
Jay Brandes William Gaines	Department of Commerce	17 November 1988
Peter Cover	Department of Energy	22 November 1988
Vance Elliot	Africa Bureau- A.I.D.	30 November 1988
William Barron	Africa Bureau- A.I.D.	1 December 1988
Michael Stack Harvey Himberg	OPIC	7 December 1988
Patricia Koshel Neal Zank	PPC Bureau- A.I.D.	8 December 1988
Robert Friedline	PRE Bureau- A.I.D.	8 December 1988
Robert Ichord Robert Archer	ANE Bureau- A.I.D.	9 December 1988
John Wisniewski	EXIMBANK	19 December 1988

The staff of the Office of Energy also met with the following to review the PSED Project:

Nancy Frame	Trade & Development Program- A.I.D.	17 October 1988
Stephen Tisa	Office of General Counsel- A.I.D.	30 November 1988
David Hagen	ANE Bureau- A.I.D.	8 December 1988
	DOC Major Projects Coordinating Committee	5 January 1989

ANNEX M

ISSUES PAPER FOR PROJECT IDENTIFICATION DOCUMENT

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT

(PSED)

Project Number 936-5738

MEMORANDUM

TO: See Distribution

FROM: S&T/EY; James B. Sullivan November 7, 1988

SUBJECT: Issues Paper for the Project Identification Document of the Private Sector Energy Development Project

The following points summarize the issues and discussions that were brought up at the review meetings on the Project Identification Document for the Private Sector Energy Development Project (PSED). The meeting of the Review Committee was held on October 19, 1988 and included representatives from the following offices: S&T/EY, AFR/TR/ANR/NR, ANE/TR/ENR, PPC/PDPR/RP, and S&T/EN. On November 1, 1988 representatives from the S&T/EY and S&T/PO offices participated in a second review meeting of the PSED Project Identification Document.

ISSUE #1 - Will sufficient resources be available for countries that have not yet adopted the private sector power approach to power and energy development?

The countries of Africa received particular attention in the discussion of this issue. The consensus of the Review Committee was that without proper safeguards, those countries furthest along the path to adopting the private power approach could monopolize project resources. If so, some African countries, in particular, and certain Latin American and Asian countries could possibly not receive maximum benefit from the PSED project.

Several possible solutions were offered:

o Given the different levels of progress toward the adoption of the private sector power approach between regions, the Project Paper could provide a strategic plan specific to each region. For instance, many African countries may be more in need of policy assistance than feasibility study assistance. Also, for Africa, the Review Committee noted that collaboration with PVOs and the African Development Bank could be a way to begin a more serious discussion of private power. (Two possible projects that are under consideration in the African Development Bank were mentioned in this context: 1) the Private Sector lending Window, 2) the Sub-Saharan Energy Sector Assessment.)

In conjunction with the concept of developing regional strategies, it was noted that in promoting the participation of the private sector as a viable alternative to government energy production, a likely source of support in project-assisted countries could be the Ministries of Finance rather than those institutions in charge of power production. Finally, the Review Committee suggested that the Missions should be consulted during the development of the Project Paper to determine the potential level of buy-ins, and to obtain any information on potential sub-projects (e.g. new power plants) that would benefit from the PSED Project.

o As suggested, an alternative to the regional strategy approach would be to group countries 1) by the strength of the operational efficiency of their utilities, and 2) the strength of their financial positions. It was recognized that both of these factors play an important role in determining the perceived need for the participation of the private sector in electric power generation and distribution, as well as in determining the viability of such a strategy. Such a country-specific approach would prevent a generalization of individual country characteristics that might result from a regional strategy approach.

RESOLUTION

An analysis of various A.I.D.-assisted countries will be undertaken during the development of the Project Paper. Based upon this analysis the countries will be grouped in three categories:

1) Those countries with no laws, regulations or guidelinges for the participation of the private sector in energy development, and with little public discussion of the subject.

2) Those countries with laws but no regulations or guidelines for the participation of the private sector in energy development, and a high level of public interest in the subject.

3) Those countries with laws, and regulations or guidelines regarding the private sector participation in energy development, and that have received proposals, particularly for private electric power generation and distribution.

The various component activities of the PSED Project will be packaged differently to address the needs of the countries in each of these three categories.

ISSUE #2 - Should the PSED Project extend beyond the power sector to include other energy sectors?

The consensus developed was that although the project should concentrate primarily on electric power, the Project Paper should leave open the possibility of working in other sectors. This would avoid the need to amend the project once it is in the implementation stage should the opportunity for private sector involvement arise in another energy sector. The Review Committee also believed that the project should also leave open the possibility of working to privatize and strengthen capital markets since they may be vital to the development of private power.

RESOLUTION

The Project Paper will provide the flexibility for the project to assist in non-power areas of energy, and will address how the project can assist capital market development.

ISSUE #3 - How can the PSED Project obtain access to experts on private power who are paid at rates higher than normally allowed by the U.S. government?

In order to provide technical assistance to officials in developing countries, the project must have access to high level experts that have been active in negotiating power purchase agreements and in developing private power projects. These experts may be used extensively in the Energy Policy Reform and Energy Institutional Development component as well as in the Private Energy Development and Private Energy Finance components. In order to obtain their services however, they frequently must be compensated at rates higher than those allowed under U.S. government standards.

RESOLUTION

This issue will be taken up further in the procurement section of the Project Paper.

ISSUE #4 - Should the project include provisions for bringing foreign nationals to the U.S.?

Although the PID includes a provision for establishing an internship for foreign nationals to receive training within U.S. utilities and utility commissions, the Review Committee felt bringing developing country officials to the U.S. to meet with U.S. experts and to tour U.S. facilities should be provided for in the Project Paper.

RESOLUTION

The PID and Project Paper will be revised to include more training in the U.S. for foreign nationals.

ISSUE #5 - Should the project aim to privatize existing government controlled utilities?

The PSED Project PID contains a provision for studies analyzing the privatization possibilities for selected public utilities. The studies could be a collaborative effort between S&T/EY and PRE. The Review Committee felt that this provision was not adequate in light of the project's stated purpose. It was suggested that the project should play a more active role in promoting the privatization of government utilities.

RESOLUTION

The Project Paper will be revised to more fully address this subject.

ISSUE #6 - Does the project adequately delineate the strategic options available for promoting greater private participation in the energy sector? Will model strategies for promoting private participation in the energy sector be developed?

A number of Review Committee members expressed a concern that the project does not sufficiently delineate the strategic options available to promote greater private sector participation in energy production and distribution. A related concern was that the project purpose as currently designed does not adequately emphasize policy and institutional development issues vital to increased private sector participation, while concentrating too heavily on increasing available electric power. As an alternative to the current strategy of allowing the sub-projects (e.g. actual private power plants) to drive institutional and policy changes, a suggestion was made to increase the amount of analysis on these issues. The findings of these studies would then be used to spur innovative private sector participation in energy production and distribution.

o The Review Committee also suggested that some of the issues to be analyzed include various methods of supplying greater private investment in the power sector, various forms of security for such investment, the importance of the power pricing structure, the promotion of private energy distribution, and the macroeconomic impact of private power.

RESOLUTION

The PID and Project Paper will be revised to delineate the various strategy options for encouraging private participation in the energy sector. These strategies would be analyzed and the results of this study would be provided for the mid-term evaluation in order to improve the performance of the project.

As the role of finance is crucial in promoting private energy sub-projects, a special study on this subject will be provided for in the Project Paper. The study will focus on the role of recourse, limited recourse and non-recourse financing of private energy sub-projects.

A study of the macroeconomic impact of private power in selected host countries is provided for in the PID. This will be expanded on in the Project Paper. A further discussion on the relationship of pricing and private power will be provided in the Project Paper.

ISSUE #7 - Is the PSED Project provide adequate environmental safeguards?

The Review Committee noted (1) that the project might encourage construction of energy facilities that may have an adverse environmental impacts, and (2) that it is also likely to encourage construction of more efficient and more environmentally benign advanced technologies and systems. The Review Committee felt that the Project Paper should pay greater attention to environmental issues.

RESOLUTION

The PID and Project Paper will be revised so as to recognize the importance of environmental effects of project related activities.

ISSUE #8 - Should not the project purpose be recast to indicate that the project would act as a catalyst by creating the appropriate environment for private power, rather than promising to assist in its development and financing?

The Program Office believed that the project purpose should be revised because it is overly ambitious in promising to assist in power projects representing billions of dollars of investment with it mere $7 million. It was suggested that the structuring and administering of the project would be improved if the purpose was more clearly focussed on setting up the right legal, policy and institutional environment, and on setting the stage for private power project implementation through technical assistance, training and feasibility study assistance. This would necessitate some changes in the log frame.

It was also discussed that the project goal might be revised to identify the provision of electric power as the goal rather than to accelerate sustainable social and economic development in A.I.D.-assisted countries.

RESOLUTION

It was decided that the project purpose would be reworded as follows:

> The purpose of the project is to create a favorable environment to encourage the private financing and operation of energy facilities in selected developing countries, concentrating initially on electric power.

Appropriate changes will be made to the log frame.

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ISSUE #9 - Are there some significant overlaps in activities of this project and activities of other projects in the Office of Energy?

It was noted that other projects of the Office of Energy, such as the Energy Policy Development and Conservation Project (936-5728), list activities similar to those to be undertaken by the PSED Project.

It was explained that prior to the development of a full project on private sector energy, the Office of Energy has been involved in encouraging this approach under its currently approved projects. Due to the significant increase in interest in this area by A.I.D.-assisted countries, the Office has chosen to devote resources to a fully authorized project.

RESOLUTION

Similar activities identified in the other Office of Energy projects will be either merged into the PSED Project or coordinated closely with the project. This will be addressed in more detail in the Project Paper.

ISSUE #10 - The Project could not provide "energy officers" to the missions.

"Energy officers" to the missions are direct-hire A.I.D. employees. Project funds cannot be used for direct-hires. "Energy consultants" to selected host countries would be more appropriate phrasing.

RESOLUTION

The PID and Project Paper will be changed to read that the project will provide "energy consultants" to selected host countries.

ISSUE #11 - Why were the approach or approaches to achieve cooperation between U.S. and non-U.S. agencies, and the structure and operation of the private power feasibility study fund not more clearly set forth?

These matter were not fully addressed because they represent complex issues that are to be resolved in the Project Paper.

RESOLUTION

These matters will be addressed in the Project Paper.

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ANE/TR, Rober Ichord, Room 4440 NS
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USAID/Rabat, Steve Klein
USAID/San Jose, Heriberto Rodriguez
USAID/San Jose, Lewis Lucke
REDSO/West Africa, Charles Moseley

ANNEX N

FEASIBILITY STUDY/SUBPROJECT DEVELOPMENT ASSISTANCE FUND

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT
PSED

PROJECT NUMBER 936-5738

STATEMENT OF WORK
for the
PRIVATE SECTOR ENERGY DEVELOPMENT
FEASIBILITY FUND

The Private Sector Energy Development Feasibility Fund Contractor will serve as Feasibility Fund administrator on a worldwide basis. The Feasibility Study Fund Contractor will be responsible for several key functions, including the following tasks:

TASK 1. Promote to the U.S. energy industry and financial community, A.I.D. Regional Bureaus and Missions, A.I.D.-assisted countries, especially energy-related ministries, public utilities, private utilities, and businesses and industries the Private Sector Energy Development Program so that qualified parties are aware of the existence of the Feasibility Study Fund, its purpose and how to access it.

After prior consultation with, review by, and approval of S&T/EY, the Contractor will do the following:

a. Prepare a news release and brochure on the Private Sector Energy Development Feasibility Study Fund, distribute the news release and brochure at least once each year, annually update the brochures and news release;

b. Prepare and place annual announcements of the availability of funds in the Commerce Business Daily, the "Private Power Reporter" of A.I.D., and other trade journals. The annual Announcement of Availability of Funds and the Request for Application will contain, but not be limited to, the following:

- o Description of the Fund and its purpose
- o Priority areas of interest for funding projects
- o Proposal selection criteria
- o Proposal evaluation and review procedures
- o Schedule for submitting applications;

c. Notify selected trade associations, (including the Electrical Power Research Institute (EPRI) and the Edison Electric Institute,) of the Feasibility Study Fund and the PSED Project;

TASK 2. Implement the Feasibility Study Fund under the guidance of the PSED Project Director and the guidance and approval of (S&T/EY) the following:

a. A complete application package for the Feasibility Study Fund, within 30 days of contract execution.

b. A request for applications for publication in the Commerce Business Daily and other publications, within 30 days of contract execution.

c. A detailed description and forms with weighted selection criteria for proposal evaluation, which will include technical, financial, economic, and environmental elements, within 30 days of contract execution.

d. Assist applicant for assistance in application preparation by answering questions, meeting at least once with each applicant, and explaining application requirements.

e. Receive applications and forward copies to the PSED Project Director and S&T/EY immediately upon receipt.

f. Perform an analysis of the proposals using the evaluation criteria.

g. Review the proposals for feasibility studies with the PSED Project Director, S&T/EY staff, and others designated by S&T/EY. The selection of "assistance recipients" will be made by judging them against the criteria (and not against one another, using the traditional grant selection approach) on a first-come, first-served basis until the funds available each year are totally committed.

h. Prepare a standard form agreement in consultation with the A.I.D. Office of General Counsel and Office of Procurement for execution by the assistance recipients with appropriate clauses to reserve appropriate rights to the U.S. government similar to conditions for direct A.I.D. grants, such as rights of access to examine recipient records; and submit a draft model agreement to the PSED Project Director and S&T/EY within 30 days of contract execution.

i. Upon approval by S&T/EY, execute the standard form agreement with the assistance recipients.

j. Receive receipt invoices, and verify them for consistency with the standard form agreement and A.I.D. policy.

k. Pay verified invoices.

l. Monitor and as necessary audit activities of assistance recipients.

m. Arrange for repayments of assistance, if applicable.

n. Close out completed or discontinued agreements.

Revised--11/2/88

PLEASE SUBMIT TWO (2) COPIES OF COMPLETED QUESTIONNAIRE

Date Received:_____

S&T/EY:_____

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
OFFICE OF ENERGY
PRIVATE SECTOR EVERGY DEVELOPMENT PROJECT
QUALIFICATION QUESTIONNAIRE
FOR
INVESTOR SUB-PROJECTS

Submitted by:

Company Name:
Mailing Address:

Telephone:
Contact:

Country: _____
Total Estimated Cost of the Project:
$_____
Total Estimated U.S. Exports:
$_____

Total Cost of Feasibility Study:
$_____

Amount TDP is Being Requested to Furnish:
$_____

INTRODUCTION

The Private Sector Energy Development Project, through the U.S.A.I.D. Office of Energy, provides funding to U.S. companies for feasibility studies connected with potential private power investments in developing countries. Investor project feasibility studies are financed by the Agency for International Development on a cost-sharing "reimbursable grant" basis to provide asistance to investors in investigating and developing prospective projects. An investor project is a project in which a private firm intends to make an equity investment if the feasibility study establishes the technical and economic feasibility of the project and profitability of the investment. A.I.D. will provide up to one-half of the cost of the study, on condition that the investor reimburse A.I.D. in the amount of the grant if and when the investment is actually made.

Funding provided by A.I.D. is limited to any U.S. citizen, corporation, partnership or other association substantially benefically owned by U.S. citizens. Applicant firms submitting requests for funding must be determined by A.I.D. to be capable of making and successfully executing the contemplated study and implementing the project, such firms being prima facie eligible to participate in the Office of Energy's Private Sector Energy Development Project. Such firms should also be prepared to execute an agreement to reimburse A.I.D. for its funding costs should the study be followed by an investor decision to assume the planned equity position.

Applicants must possess sufficient financial resources and/or the business experience necessary to provide or attract the financing and management which implementation of the project would require. Normally, applicants must demonstrate the ability to provide at least 20 percent of the equity in the project proposed for the study and the ability to obtain financing for the balance.

The following application should be fully completed by the applicant and may be suplemented with additional background materials.

A. Project Description:

1. Indicate the category of economic activity in which the proposed project can be classified:

Energy	[ ]
Agribusiness	[ ]
Minerals	[ ]
Industry	[ ]
Transportation	[ ]
Communications	[ ]
Other (specify)	[ ]

_____

_____

_____

2. Describe briefly the project:

3. Describe briefly the physical investment (machinery and equipment, infrastructure, etc.) to be made:

4. Describe briefly the technical processes involved:

5. Is the process successfully in operation in:

	Yes	No
The host country	[ ]	[ ]
The U.S.A.	[ ]	[ ]
Other Countries (specify)	[ ]	[ ]

If "Yes" to any of the above, indicate how long the process has been operational:

6. Provide a proposed time schedule for the project including: (a) the expected start of the study; (b) expected completion date of the study; (c) estimated date by which an investment decision is to be made.

B. Project Finances:

1. Estimated capital requirements of the project in equivalent U.S. dollars:

Land	$_____
Buildings	$_____
Machinery & Equipment	$_____
Other (specify)	$_____
TOTAL	$_____

2. Estimated working capital requirements in equivalent U.S. dollars:

$_____

3. Planned debt-equity structure:

Debt	$_____	_____%
Equity	$_____	_____%

4. Estimated amount and form of equity investment in equivalent U.S. dollars:

By applicant	$_____
By host country partners (if any)	$_____
By others (specify)	$_____
TOTAL	$_____

5. Describe in detail the project financing plan and identify financial or other institutions which have indicated their willingness to provide the debt financing for this project. (ATTACH commitment letters).

C. Compliance with A.I.D. Policy Objectives:

1. What raw materials and machinery and equipment will need to be imported for the project?

2. Where will the imported raw materials be obtained?

The U.S.A. { }

Other industrial countries { }

Unknown at this time { }

If from the U.S.A., provide an estimate of annual procurements by type of raw materials and value:

3. Where will the imported machinery and equipment be obtained?

The U.S.A. { }

Other industrial countries { }

Unknown at this time { }

If from the U.S.A., provide an estimate of the machinery and equipment value by major category.

4. If the U.S.A. is not competitive in supplying the machinery and equipment and/or the raw materials for the project, it is for the following reason(s):

Technology	[ ]
Quality	[ ]
Service	[ ]
Price	[ ]
Financing	[ ]
Other (specify)	[ ]

_____

_____

_____

5. If the project's products are to be exported, indicate what type of products are involved, how much will be exported, and to whom:

6. Will the project's products compete with current exports from the U.S.A. in the host country or other markets?

Yes [ ] No [ ]

If "yes", give details:

7. Will the project promote U.S. access to any of the host country's natural resources?

Yes [ ] No [ ]

If "yes", give details:

D. Development Impact on the Host Country

1. Is the project part of the host country's formal development plan?

   Yes [ ] No [ ]

   If "yes", provide quotations from pertinent portions of the development plan:

2. Is the technology embodied in the machinery and/or process new to the country?

   Yes [ ] No [ ]

3. Approximately how many full-time workers will the project employ at full-scale capacity?

4. What is the capital/labor ratio (divide total investment by number of workers employed)?

5. Does the host country have the required:

	Yes	No
Mangement personnel	[ ]	[ ]
Technical personnel	[ ]	[ ]

   If "no", explain how the lack of required personnel will be resolved:

6. Would the project meet U.S. Environmental Protection Agency standards?

Yes [ ] No [ ]

If "no", explain the areas in which the project would probably not comply with EPA standards:

E. Host Country Support and Participation

1. Has this project been discussed with:

	YES	NO
Host country government officials	[ ]	[ ]
U.S. Embassy Officials	[ ]	[ ]
A.I.D. Mission	[ ]	[ ]

If "yes", list details and attach key correspondence relating to this aspect:

2. Has the project been discussed with private sector entities or individuals in the host country?

Yes [ ] No [ ]

If "yes", list details and attach letters of commitment relating to this aspect:

3. Will any specific actions be required from the host country government to assure success of this project such as:

Tax concessions [ ]

Tariff exemptions [ ]

Import restrictions [ ]

Exploration licenses [ ]

Grants of subsidies [ ]

Other (specify) [ ]

_____

_____

_____

4. Will the host country be paying for part of the proposed study?

Yes [ ] No [ ]

If "yes", indicate how much (dollars and percentage of total costs):

F. Feasibility Study

1. Have you conducted a preliminary study to examine the demand for this project's product(s)?

Yes [ ] No [ ]

If "yes", attach a copy of such study.

If "no", how have you determined that a demand exists for the product(s)?

2. In which of the following areas do actual or potential concerns exist and to what degree:

	None	Minor	Major
Market	[ ]	[ ]	[ ]
Raw materials and other inputs	[ ]	[ ]	[ ]
Location and site	[ ]	[ ]	[ ]
Technology	[ ]	[ ]	[ ]
Manpower/management	[ ]	[ ]	[ ]
Financial and economic viability	[ ]	[ ]	[ ]

With regard to areas of "Major" concern, provide further details:

3. The feasibility study will be carried out by:

The applicant [ ] Independent consultants [ ]

4. The cost estimate of the feasibility study is as follows:

(Contingency items may be included, but are limited to 10% of each major category. Remuneration of investor salary and overhead may not exceed $400 per person per day. Remuneration for consultants, including fee and overhead, may not exceed $400 per person per day. Subsistence, expenses may not exceed official U.S. Government rates in that country/city. Subsistence expenses are not allowed within the U.S.)

Direct Labor (specify names & titles of professionals for whom reimbursement will be sought and the current rate of remuneration for each such professional)	Estimated Man-Days In Host Country	In USA	Total	Daily Rate	Est. Cost	To Es

Labor Overhead	Rate	Base	Est. Cost
Fringe benefits (Indirect payroll cost)			

Other Direct Costs	Est. Cost
Travel (based on coach class)	
Per Diem in host country: _____ days @ $_____	
Host country consultants	
Other (specify)	
Total estimated cost	

NOTE: No more than one-third of the total estimated cost may be home expenses of the applicant.

5. Provide in Attachment A a detailed plan for the feasibility study including, but not limited to:

   a) Detailed scope of work;

   b) Order in which the various tasks will be carried out;

   c) Staffing of the tasks (names and professional qualifications of persons who will carry out the study and aspects of the study for which each will be responsible);

   d) Description and due dates of reports, including:

      - Projected profitability of proposed project, taking into account both existing and projected operating cost and market demand.

      - Analysis of alternatives of projected project, taking into account both existing and projected operating costs and market demand.

      - Any additional unique or peculiar factors which could have an influence upon the ultimate success of the project if undertaken; and

   e) Planned travel in connection with the study.

6. Identify costs incurred for this project to date and the purpose of related expenditures:

7. Identify source of information which prompted the submission of this request to A.I.D.:

8. List other institutions and/or U.S. Government agencies to which request has been submitted and their response:

9. What is the overriding reason for submitting this proposal for A. to participate in the financing of the feasibility study?

   Financial [ ] Prestige [ ] Other (specify) [ ]

10. What will happen to this project if A.I.D. is unable to participa in the financing of the feasibility study?

G. Applicant's Qualifications

1. Provide the following information relevant to the applicant:

   a) Legal name:

   b) Type of organization:

   c) Where and when incorporated:

   d) Percentage of ownership and voting rights held by U.S. citize

   e) Major project line or services performed by the entity:

ATTACH a copy of last three years' financial statements.

2. List bank and other references:

3. Provide past experience in implementing similar projects in:

   a) U.S.A.

   b) Abroad

4. List other projects financed by (a) A.I.D., (b) U.S. Export Impo
   Bank, and (c) Overseas Private Investment Corporation.

ANNEX N

FEASIBILITY STUDY/SUBPROJECT DEVELOPMENT ASSISTANCE FUND

PROJECT PAPER

PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT
PSED

PROJECT NUMBER 936-5738

STATEMENT OF WORK
for the
PRIVATE SECTOR ENERGY DEVELOPMENT
FEASIBILITY FUND

The Private Sector Energy Development Feasibility Fund Contractor will serve as Feasibility Fund administrator on a worldwide basis. The Feasibility Study Fund Contractor will be responsible for several key functions, including the following tasks:

TASK 1. Promote to the U.S. energy industry and financial community, A.I.D. Regional Bureaus and Missions, A.I.D.-assisted countries, especially energy-related ministries, public utilities, private utilities, and businesses and industries the Private Sector Energy Development Program so that qualified parties are aware of the existence of the Feasibility Study Fund, its purpose and how to access it.

After prior consultation with, review by, and approval of S&T/EY, the Contractor will do the following:

a. Prepare a news release and brochure on the Private Sector Energy Development Feasibility Study Fund, distribute the news release and brochure at least once each year, annually update the brochures and news release;

b. Prepare and place annual announcements of the availability of funds in the Commerce Business Daily, the "Private Power Reporter" of A.I.D., and other trade journals. The annual Announcement of Availability of Funds and the Request for Application will contain, but not be limited to, the following:

- o Description of the Fund and its purpose
- o Priority areas of interest for funding projects
- o Proposal selection criteria
- o Proposal evaluation and review procedures
- o Schedule for submitting applications;

c. Notify selected trade associations, (including the Electrical Power Research Institute (EPRI) and the Edison Electric Institute,) of the Feasibility Study Fund and the PSED Project;

TASK 2. Implement the Feasibility Study Fund under the guidance of the PSED Project Director and the guidance and approval of (S&T/EY) the following:

a. A complete application package for the Feasibility Study Fund, within 30 days of contract execution.

b. A request for applications for publication in the Commerce Business Daily and other publications, within 30 days of contract execution.

c. A detailed description and forms with weighted selection criteria for proposal evaluation, which will include technical, financial, economic, and environmental elements, within 30 days of contract execution.

d. Assist applicant for assistance in application preparation by answering questions, meeting at least once with each applicant, and explaining application requirements.

e. Receive applications and forward copies to the PSED Project Director and S&T/EY immediately upon receipt.

f. Perform an analysis of the proposals using the evaluation criteria.

g. Review the proposals for feasibility studies with the PSED Project Director, S&T/EY staff, and others designated by S&T/EY. The selection of "assistance recipients" will be made by judging them against the criteria (and not against one another, using the traditional grant selection approach) on a first-come, first-served basis until the funds available each year are totally committed.

h. Prepare a standard form agreement in consultation with the A.I.D. Office of General Counsel and Office of Procurement for execution by the assistance recipients with appropriate clauses to reserve appropriate rights to the U.S. government similar to conditions for direct A.I.D. grants, such as rights of access to examine recipient records; and submit a draft model agreement to the PSED Project Director and S&T/EY within 30 days of contract execution.

i. Upon approval by S&T/EY, execute the standard form agreement with the assistance recipients.

j. Receive receipt invoices, and verify them for consistency with the standard form agreement and A.I.D. policy.

k. Pay verified invoices.

l. Monitor and as necessary audit activities of assistance recipients.

m. Arrange for repayments of assistance, if applicable.

n. Close out completed or discontinued agreements.

Revised--11/2/88

PLEASE SUBMIT TWO (2) COPIES OF COMPLETED QUESTIONNAIRE

Date Received:_____

S&T/EY:_____

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
OFFICE OF ENERGY
PRIVATE SECTOR ENERGY DEVELOPMENT PROJECT
QUALIFICATION QUESTIONNAIRE
FOR
INVESTOR SUB-PROJECTS

Submitted by:

Company Name:
Mailing Address:

Telephone:
Contact:

Country: _____
Total Estimated Cost of the Project:
$_____
Total Estimated U.S. Exports:
$_____

Total Cost of Feasibility Study:
$_____

Amount TDP is Being Requested to Furnish:
$_____

INTRODUCTION

The Private Sector Energy Development Project, through the U.S.A.I.D. Office of Energy, provides funding to U.S. companies for feasibility studies connected with potential private power investments in developing countries. Investor project feasibility studies are financed by the Agency for International Development on a cost-sharing "reimbursable grant" basis to provide asistance to investors in investigating and developing prospective projects. An investor project is a project in which a private firm intends to make an equity investment if the feasibility study establishes the technical and economic feasibility of the project and profitability of the investment. A.I.D. will provide up to one-half of the cost of the study, on condition that the investor reimburse A.I.D. in the amount of the grant if and when the investment is actually made.

Funding provided by A.I.D. is limited to any U.S. citizen, corporation, partnership or other association substantially benefically owned by U.S. citizens. Applicant firms submitting requests for funding must be determined by A.I.D. to be capable of making and successfully executing the contemplated study and implementing the project, such firms being prima facie eligible to participate in the Office of Energy's Private Sector Energy Development Project. Such firms should also be prepared to execute an agreement to reimburse A.I.D. for its funding costs should the study be followed by an investor decision to assume the planned equity position.

Applicants must possess sufficient financial resources and/or the business experience necessary to provide or attract the financing and management which implementation of the project would require. Normally, applicants must demonstrate the ability to provide at least 20 percent of the equity in the project proposed for the study and the ability to obtain financing for the balance.

The following application should be fully completed by the applicant and may be suplemented with additional background materials.

A. Project Description:

1. Indicate the category of economic activity in which the proposed project can be classified:

Energy	[ ]
Agribusiness	[ ]
Minerals	[ ]
Industry	[ ]
Transportation	[ ]
Communications	[ ]
Other (specify)	[ ]

_____

_____

_____

2. Describe briefly the project:

3. Describe briefly the physical investment (machinery and equipment, infrastructure, etc.) to be made:

4. Describe briefly the technical processes involved:

5. Is the process successfully in operation in:

	Yes	No
The host country	[ ]	[ ]
The U.S.A.	[ ]	[ ]
Other Countries (specify)	[ ]	[ ]

If "Yes" to any of the above, indicate how long the process has been operational:

6. Provide a proposed time schedule for the project including: (a) the expected start of the study; (b) expected completion date of the study; (c) estimated date by which an investment decision is to be made.

B. Project Finances:

1. Estimated capital requirements of the project in equivalent U.S. dollars:

Land	$_____
Buildings	$_____
Machinery & Equipment	$_____
Other (specify)	$_____
TOTAL	$_____

2. Estimated working capital requirements in equivalent U.S. dollars:

$_____

3. Planned debt-equity structure:

Debt	$_____	_____%
Equity	$_____	_____%

4. Estimated amount and form of equity investment in equivalent U.S. dollars:

By applicant	$_____
By host country partners (if any)	$_____
By others (specify)	$_____
TOTAL	$_____

5. Describe in detail the project financing plan and identify financial or other institutions which have indicated their willingness to provide the debt financing for this project. (ATTACH commitment letters).

C. Compliance with A.I.D. Policy Objectives:

1. What raw materials and machinery and equipment will need to be imported for the project?

2. Where will the imported raw materials be obtained?

The U.S.A. { }

Other industrial countries { }

Unknown at this time { }

If from the U.S.A., provide an estimate of annual procurements by type of raw materials and value:

3. Where will the imported machinery and equipment be obtained?

The U.S.A. { }

Other industrial countries { }

Unknown at this time { }

If from the U.S.A., provide an estimate of the machinery and equipment value by major category.

4. If the U.S.A. is not competitive in supplying the machinery and equipment and/or the raw materials for the project, it is for the following reason(s):

Technology	[ ]
Quality	[ ]
Service	[ ]
Price	[ ]
Financing	[ ]
Other (specify)	[ ]

_____

_____

5. If the project's products are to be exported, indicate what type of products are involved, how much will be exported, and to whom:

6. Will the project's products compete with current exports from the U.S.A. in the host country or other markets?

Yes [ ] No [ ]

If "yes", give details:

7. Will the project promote U.S. access to any of the host country's natural resources?

Yes [ ] No [ ]

If "yes", give details:

D. Development Impact on the Host Country

1. Is the project part of the host country's formal development plan?

   Yes [ ] No [ ]

   If "yes", provide quotations from pertinent portions of the development plan:

2. Is the technology embodied in the machinery and/or process new to the country?

   Yes [ ] No [ ]

3. Approximately how many full-time workers will the project employ at full-scale capacity?

4. What is the capital/labor ratio (divide total investment by number of workers employed)?

5. Does the host country have the required:

	Yes	No
Mangement personnel	[ ]	[ ]
Technical personnel	[ ]	[ ]

   If "no", explain how the lack of required personnel will be resolved:

6. Would the project meet U.S. Environmental Protection Agency standards?

Yes [ ] No [ ]

If "no", explain the areas in which the project would probably not comply with EPA standards:

E. Host Country Support and Participation

1. Has this project been discussed with:

	YES	NO
Host country government officials	[ ]	[ ]
U.S. Embassy Officials	[ ]	[ ]
A.I.D. Mission	[ ]	[ ]

If "yes", list details and attach key correspondence relating to this aspect:

2. Has the project been discussed with private sector entities or individuals in the host country?

Yes [ ] No [ ]

If "yes", list details and attach letters of commitment relating to this aspect:

3. Will any specific actions be required from the host country government to assure success of this project such as:

Tax concessions [ ]

Tariff exemptions [ ]

Import restrictions [ ]

Exploration licenses [ ]

Grants of subsidies [ ]

Other (specify) [ ]

_____

_____

_____

4. Will the host country be paying for part of the proposed study?

Yes [ ] No [ ]

If "yes", indicate how much (dollars and percentage of total costs):

F. Feasibility Study

1. Have you conducted a preliminary study to examine the demand for this project's product(s)?

Yes [ ] No [ ]

If "yes", attach a copy of such study.

If "no", how have you determined that a demand exists for the product(s)?

2. In which of the following areas do actual or potential concerns exist and to what degree:

	None	Minor	Major
Market	[ ]	[ ]	[ ]
Raw materials and other inputs	[ ]	[ ]	[ ]
Location and site	[ ]	[ ]	[ ]
Technology	[ ]	[ ]	[ ]
Manpower/management	[ ]	[ ]	[ ]
Financial and economic viability	[ ]	[ ]	[ ]

With regard to areas of "Major" concern, provide further details:

3. The feasibility study will be carried out by:

The applicant [ ] Independent consultants [ ]

4. The cost estimate of the feasibility study is as follows:

(Contingency items may be included, but are limited to 10% of each major category. Remuneration of investor salary and overhead may not exceed $400 per person per day. Remuneration for consultants, including fee and overhead, may not exceed $400 per person per day. Subsistence, expenses may not exceed official U.S. Government rates in that country/city. Subsistence expenses are not allowed within the U.S.)

Direct Labor (specify names & titles of professionals for whom reimbursement will be sought and the current rate of remuneration for each such professional)	Estimated Man-Days In Host Country	In USA	Total	Daily Rate	Est. Cost	Tot Est

Labor Overhead	Rate	Base	Est. Cost
Fringe benefits (Indirect payroll cost)			

Other Direct Costs	Est. Cost
Travel (based on coach class)	
Per Diem in host country: _____ days @ $_____	
Host country consultants	
Other (specify)	
Total estimated cost	

NOTE: No more than one-third of the total estimated cost may be home o expenses of the applicant.

5. Provide in Attachment A a detailed plan for the feasibility study including, but not limited to:

   a) Detailed scope of work;

   b) Order in which the various tasks will be carried out;

   c) Staffing of the tasks (names and professional qualifications of persons who will carry out the study and aspects of the study for which each will be responsible);

   d) Description and due dates of reports, including:

      - Projected profitability of proposed project, taking into account both existing and projected operating cost and market demand.

      - Analysis of alternatives of projected project, taking into account both existing and projected operating costs and market demand.

      - Any additional unique or peculiar factors which could have an influence upon the ultimate success of the project if undertaken; and

   e) Planned travel in connection with the study.

6. Identify costs incurred for this project to date and the purpose of related expenditures:

7. Identify source of information which prompted the submission of this request to A.I.D.:

8. List other institutions and/or U.S. Government agencies to which t request has been submitted and their response:

9. What is the overriding reason for submitting this proposal for A.I to participate in the financing of the feasibility study?

Financial [ ] Prestige [ ] Other (specify) [ ]

10. What will happen to this project if A.I.D. is unable to participat in the financing of the feasibility study?

G. Applicant's Qualifications

1. Provide the following information relevant to the applicant:

   a) Legal name:

   b) Type of organization:

   c) Where and when incorporated:

   d) Percentage of ownership and voting rights held by U.S. citize

   e) Major project line or services performed by the entity:

ATTACH a copy of last three years' financial statements.

2. List bank and other references:

3. Provide past experience in implementing similar projects in:

   a) U.S.A.

   b) Abroad

4. List other projects financed by (a) A.I.D., (b) U.S. Export Impor Bank, and (c) Overseas Private Investment Corporation.

5. ATTACH resumes of Applicant's personnel selected to conduct this feasibility study.

H. Consultant's Qualifications

1. Provide the ;following information relevant to any outside consulting firm conducting all or part of the proposed feasibility study:

a) Legal name:

b) Type of organization:

c) Where and when incorporated:

d) Percentage of ownership and voting rights held by U.S. citizer

e) Major project line or services performed by the entity:

ATTACH a copy of last three years' financial statements.

2. List bank and other references:

3. Provide past experience in implementing similar projects in:

a) U.S.A.

b) Abroad

4. List other projects financed by (a) A.I.D., (b) U.S. Export Import Bank, and (c) Overseas Private Investment Corporation.

5. ATTACH resumes of Consultant's personnel selected to conduct this feasibility study.

ATTACHMENT A

Definitional Plan for Feasibility Study (see F.5, page 14)

NOTE: The proposed study sould cover the economic and technical feasibility of the proposed project, including, inter alia:

1. General analysis of local business conditions, with specific reference to market potential of the proposed project.

2. Site studies, including analysis of relative realty prices, geological conditions, construction costs, availability of labor, market impact as those factors are affected by site location.

3. Engineering and construction feasibility, including reference to local laws and regulations as they may affect building design.

4. [illegible] supply, with analysis of wage scales and availability of qualified technical and administrative personnel.

5. Projected profitability of proposed project, taking into account existing and projected operating costs and market demand.

6. Analysis of alternatives to proposed project, taking into account both existing and projected operating costs and market demand.

7. Any additional unique or peculiar factors which could have an influence upon the ultimate success of the project.

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