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**Energy Conservation Services Program
Third Quarterly Report, FY 1986
(4/1/86-6/30/86)**

Contract No. DAN-5728-C-00-3073-00

HBC Reference No. 86-150(11)

Prepared for:
**U.S. Agency for International Development
Office of Energy**

Washington, DC 20523

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The Energy Conservation Services Program (ECSP) provides a broad range of technical advisory services, training, and information dissemination activities to AID-assisted countries.* The objective of this 4-year program is to promote energy conservation in industry, transportation, electric power generation and transmission, and commercial and institutional building design and operation. On September 15, 1983, the U.S. Agency for International Development (AID) contracted with Hagler, Bailly & Company (prime contractor) and Reliance Energy Services (subcontractor) to provide technical and management assistance to the program. In November of 1984, Hagler, Bailly & Company became a subsidiary of RCG International. As part of this acquisition, the operations of Reliance Energy Services, another RCG subsidiary, were merged with Hagler, Bailly & Company.

Since the inception of the program, 35 projects have been initiated, 23 of these projects have been completed and 12 are still ongoing (see Exhibit 1 for a summary of all ECSP activities). No new initiatives have been started since October 1986, due to funding problems. All present initiatives represent ongoing projects from previous commitments.

Since the inception of the program 55 reports, presentations, manuals, and other papers have been prepared (not including some working papers and memorandum). A comprehensive list is provided in Appendix 1.

The third Quarterly Activity Report of the third year of ECSP covers the period of April 1, 1986 to June 30, 1986. During the quarter, progress was made on 12 projects. Several reports were finalized during this quarter, including Cogeneration in Developing Countries; Private-Sector Power Generation in Pakistan; and Implementation of Fuel Cost Reduction Measures In Costa Rican Private Bus and Taxi Fleets. First drafts of two additional studies were also completed: Energy Conservation in Developing Countries: Identification and Analysis of the Barriers to Private Investment; and Road Transportation Energy Conservation: Needs and Options in Developing Countries.

In addition, the second meeting of the Technology Transfer Team was held.

A total of 9 professional person-days was spent in Costa Rica and Guatemala (see individual reports for time spend in each country). Quarterly expenditures, as shown in Exhibit 2, were \$170,701 for this quarter, as compared with \$242,866 in the second quarter of the third year of the program (see Exhibits 3 and 4).

*This program is part of the Energy Policy Development and Conservation Project (Project No. 936-5728).

Exhibit 1

Summary of ECSP Activities
(Inception to date)

A C T I V I T Y	Period of Performance	Budget	Cumulative expenditures (6/30/86)*
1. Program management and development, including preparation of in-country missions and program planning activities; publication of descriptive brochure on ECSP; providing technical assistance to AID-, ESCAP-, and National Research Council-sponsored meetings; preparation of an international mailing list of individuals working on energy conservation in developing countries; preparation of a cogeneration in developing countries analysis. (HBC reference 150/151)	9-15/83-ongoing	None	\$429,068
2. Organization, preparation, and presentation of 2-week energy demand management and conservation training course in Sri Lanka for Ministry of Power and Technology -- December 7-17, 1983 (HBC reference 152)	10/10/83-12/30/83	\$124,131	\$125,561
3. Support in preparation of Technology Transfer for Energy Management Project Paper with U.S.AID/Philippines and Ministry of Energy/Bureau of Energy Utilization (HBC reference 153)	9/15/83-4/30/84	None	\$88,638
4. Development of data base on AID-funded energy conservation initiatives (HBC reference 154)	10/8/83-5/11/84	\$14,451	\$13,312
5. Preparation of energy auditing manual for use in Sri Lanka (HBC reference 155)	10/21/83-2/27/84	\$38,465	\$43,715
6. Organization, preparation, and presentation of 4-week energy auditing course in Sri Lanka for Ministry of Power and Energy -- February 27-April 10, 1984 (HBC reference 156(a))	1/3/84-4/10/84	\$80,220	\$77,788

*Based on labor costs incurred and invoices received only.

Exhibit 1

Summary of ECSP Activities
(Inception to date)

A C T I V I T Y	Period of Performance	Budget	Cumulative expenditures (6/30/86)*
7. Completion of full audit reports and feasibility study of energy conservation projects for Sri Lanka Tyre Corporation and Thulhiriya Textile Mills (HBC reference 156(b))	3/15/84-8/15/84	\$69,061	\$71,017
8. Development of ECPIE: Energy Conservation Project Investment Evaluation Model and user manual (HBC reference 157)	1/3/84-8/30/84	\$23,805 **	\$43,879
9. Preparation of monograph on innovative approaches to financing energy conservation investments in less developed countries (HBC reference 158)	1/3/84-9/10/84	\$7,500 **	\$10,295
10. Completion of feasibility study of guide and directory of U.S. energy-efficient equipment for distribution to developing countries -- activity jointly sponsored with Office of Industrial Programs, U.S. Department of Energy (HBC reference 159)	1/3/84-7/12/84	\$25,000	\$26,059
11. Missions to ASEAN countries to assist in the project planning for regional building energy conservation activities (HBC reference 160)	5/5/84-6/4/84	None	\$31,785
12. Mission to assess current energy situation in the transportation sector of Costa Rica and identify possible AID-funded activities to improve energy use efficiency; conducted in cooperation with Oak Ridge National Laboratory (HBC reference 161)	5/14/84-3/31/85	None	\$29,138
13. Planning and preparation for the Latin America/Caribbean Regional Energy Conservation Seminar (HBC reference 162)	5/14/84-6/30/85	\$102,000	\$111,419

*Based on labor costs incurred and invoices received only.

**Scope of work was expanded subsequent to budget preparation.

Exhibit 1

Summary of ECSP Activities
(Inception to date)

A C T I V I T Y	Period of Performance	Budget	Cumulative expenditures (6/30/86)*
14. Missions to Ecuador and Peru to assist in developing industrial energy conservation outreach services and programs (HBC reference 163)	5/14/84-3/31/85	None	\$19,769
15. Ecuador industrial energy conservation training, curriculum development, and audits (HBC reference 164)	7/14/84-3/31/84	\$104,157	\$97,286
16. Revision of training manual for energy demand management and conservation training course for industry and buildings (HBC reference 165)	7/14/84-3/31/85	\$10,675	\$13,431
17. Revision of industrial energy audit manual (HBC reference 166)	7/14/84-9/1/84	\$14,458	\$15,242
18. Evaluation of the IIE/TVA Conventional Energy Training Project (CETP) Course (HBC reference 167)	6/30/84-8/30/84	\$19,096	\$21,704
19. Organization and planning of the Pakistan National Energy Conservation Center (HBC reference 168)	9/8/84-6/15/85	\$275,000	\$229,182
20. Industrial Energy Conservation Program (Dominican Republic) Evaluation (HBC reference 169)	10/1/84-2/28/85	\$20,000	\$23,817
21. Regional Industrial Energy Efficiency Project (Central America and Panama) Evaluation (HBC reference 170)	10/1/84-3/15/85	\$36,000	\$38,763
22. Energy Initiatives Project (Djibouti) Evaluation (HBC reference 171)	11/30/84-2/15/85	\$16,286	\$16,823
23. Fact-finding mission to Haiti to examine the energy efficiency of the sugar and manufacturing industries (HBC reference 173)	2/20/85-12/31/85	\$11,500	\$12,291

*Based on labor costs incurred and invoices received only.

Exhibit 1

Summary of ECSP Activities
(Inception to date)

ACTIVITY	Period of Performance	Budget	Cumulative expenditures (6/30/86)*
24. Joint reconnaissance visit to Sri Lanka to identify energy bottlenecks in the agricultural sector (HBC reference 177)	6/1/85-12/31/85	None	\$15,090
25. Demonstration program and public information campaign to increase energy efficiency in the transportation sector (HBC reference 178)	6/1/85-ongoing	\$130,000	\$138,208
26. Study of impediments to private sector development of non-utility power generation (HBC reference 179/1004)	9/1/85-ongoing	\$240,000	\$163,482
27. Market analysis of Cogeneration opportunities in USAID-assisted countries (HBC reference 180)	9/15/85-ongoing	\$75,000	\$13,096
28. Institutional barriers to private sector investment in energy conservation (HBC reference 181)	10/14/85-ongoing	\$60,000	\$38,728
29. General technical assistance: Thailand and Indonesia (HBC reference 182)	10/16/85-ongoing	\$140,000	\$65,537
30. Innovative private sector financing (HBC reference 183)	10/15/85-ongoing	\$75,000	\$21,861
31. Technology Transfer Teams for Energy Conservation (HBC reference 184)	10/16/85-ongoing	\$50,000	\$23,572
32. Asia/Near East Energy Conservation Promotion and Investment Workshop (HBC reference 185)	10/15/85-ongoing	\$120,000	\$12,126
33. Information exchange and energy conservation network development (HBC reference 186)	10/15/85-ongoing	\$75,000	\$21,995
34. Technology Transfer for Energy Management (HBC reference 187)	10/1/85-ongoing	\$250,000	-0-
35. India PURPA Study (HBC reference 199)	4/29/86-ongoing	\$85,252	\$6,378

*Based on labor costs incurred and invoices received only.

Exhibit 2

Third-Quarter Expenditures, FY 1986
 (Eleventh Quarter of the Contract) -- Summary

	Revised Contract Budget ²	Quarterly Expenditures ¹	Cumulative Expenditures Through 6/30/86 ¹	
			\$	%
Salaries	\$672,907	\$55,691	\$551,047	81.9
Fringe benefits	188,109	16,709	154,039	81.9
Overhead	796,291	68,800	667,271	83.8
Travel/trans./per diem	373,222	6,406	219,030	58.7
Other direct costs	108,700	19,352	164,008	150.9
Equipment	50,000	-0-	-0-	-0-
Subcontractor	<u>667,348</u>	<u>3,743</u>	<u>241,479</u>	<u>36.2</u>
Total estimated costs	\$2,856,977	170,701	1,996,874	69.9
Fixed fee	<u>123,698</u>	<u>-0-³</u>	<u>105,143</u>	<u>85.0</u>
Total estimated costs and fixed fee	\$2,980,275	\$170,701	\$2,102,017	70.5

¹Based on labor costs incurred and invoices received as of 6/30/86 and an audit conducted by Hagler, Bailly's accountants.

²\$2,673,444 has been obligated so far, of which \$554,000 has been directly contributed by Regional Bureaus and Missions. Another \$70,000 has been contributed through another contract.

³To maintain fixed fee charges at their 85 percent maximum prior to the conclusion of the contract, no fixed fee charges have been listed in this quarter.

Exhibit 3

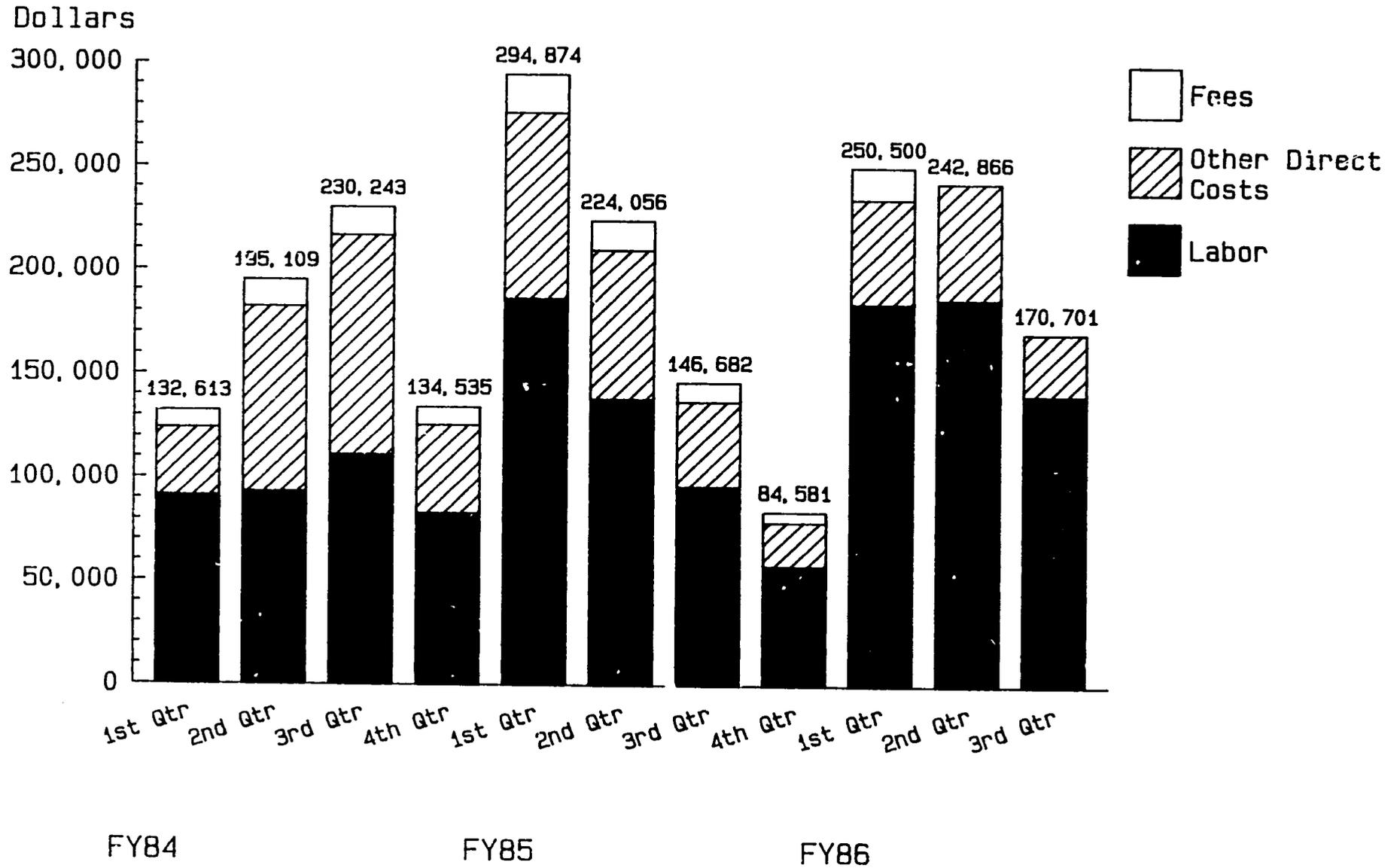
ECSP Expenditures by Quarter

First year		
First quarter	(9/15/83-12/15/83)	\$132,613
Second quarter	(12/15/83-4/1/84)	195,109
Third quarter	(4/2/84-6/30/84)	230,243
Fourth quarter	(7/2/84-9/28/84)	134,535
Yearly total		\$692,500

Second year		
First quarter	(10/1/84-12/31/84)	\$294,874
Second quarter	(1/2/85-3/31/85)	224,056
Third quarter	(4/1/85-6/30/85)	146,682
Fourth quarter	(7/1/85-9/30/85)	84,581
Yearly total		\$750,193

Third year		
First quarter	(10/1/85-12/31/85)	\$250,503
Second quarter	(1/1/86-3/31/86)	242,866
Third quarter	(4/1/86-6/30/86)	170,701

ECSP Quarterly Expenditures for Labor, Other Direct Costs, and Fees



U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Research, Development, and Demonstration

ACTIVITY: Private Sector Involvement in Non-Utility Power Generation
(Contract Task Area 6)

COUNTRY: Pakistan, Thailand, India, Indonesia

START DATE: 9/9/85

COMPLETION DATE: Ongoing

BUDGET: \$240,000

QUARTERLY EXPENDITURES: \$11,901

CUMULATIVE EXPENDITURES: \$163,482

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Alain Streicher

HBC REFERENCE: 179/1004

DESCRIPTION

The focus of this activity is on evaluating the potential for and barriers to development of cogeneration and other nonutility power generation options by the private sector in developing countries. The successful development of such options will improve fuel efficiency, increase domestic fuel utilization, enhance the resiliency and reliability of power supplies, and provide opportunities for private sector investment in areas traditionally not available to them. So far two countries have been studied (Pakistan and Thailand), the situation in India will be evaluated in the next quarter and a separate category has been created for this effort (see HBC Reference 199).

Pakistan

The final reports on the Pakistan study were completed and distributed this quarter to the Mission and other international donor organizations. Two

separate reports were prepared, one for AID/Washington and the other for the Mission in Islamabad.

Thailand

Comments have been received from AID and Thailand organizations on the draft final report. These comments are being incorporated and the final report will be completed and distributed in the next quarter.

The study focused on the potential for and impediments to development of cogeneration and other nonutility power options by the private sector in Thailand.

ACTIVITY REPORTS

- Private-Sector Small-Scale Power Generation in Pakistan: Potential, Impediments, and Policy Issues, Final Report, June 1986.

KEY PERSONNEL

- Hagler, Bailly & Company: Alain Streicher, Vice-President; Pirooz Sharafi, Senior Associate; Jack Stafurik, Senior Associate
- USAID/Washington: Robert Archer, Asia/NE; James Sullivan, S&T/EY; David Jhirad, S&T/EY
- USAID/Islamabad: John Morgan, Charles Moseley, James Bever, Energy Officers
- USAID/Bangkok: John Neave, Energy Officer.

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$2,920	\$46,606
Fringe benefits	876	13,982
Overhead	3,605	57,557
Travel/trans./per diem	1,797	29,200
Other direct costs	2,703	12,219
Equipment	---	---
Subcontractor	---	---
	<hr/>	<hr/>
Total	\$11,901	\$159,564
Fee	---	3,918
	<hr/>	<hr/>
GRAND TOTAL	\$11,901	\$163,482

The Asia/Near East Bureau has thus far contributed approximately \$100,000 to this task.

U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Research, Development, and Demonstration

ACTIVITY: Market Analysis of Cogeneration Opportunities in USAID-Assisted Countries
(Contract Task Area 7)

COUNTRY: Not country-specific

START DATE: 10/15/85

COMPLETION DATE: 12/31/86

BUDGET: \$75,000

QUARTERLY EXPENDITURES: \$4,895

CUMULATIVE EXPENDITURES: \$13,096

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Alain Streicher

HBC REFERENCE: 180

DESCRIPTION

ECSP staff are modifying the Hagler, Bailly & Company cogeneration market assessment model, which has been used for a number of years in the U.S., to estimate the economic and financial potential of cogeneration in developing countries. Based on the cost of different cogeneration technologies (e.g., fuel oil boiler with steam turbine, natural gas boiler with steam turbine, gas turbine/waste heat recovery boiler, diesel/waste heat recovery boiler), and a market divided into new, replacement, and retrofit segments, the model will estimate, for a range of equipment sizes, the possible market shares. Since every country has a different industrial structure, different fuel inputs, and different regional divisions, the model has to be changed for each country. ECSP staff have adapted the model for Pakistan and Thailand and have made trial runs to evaluate its performance. During this quarter, ECSP staff began to modify the model to fit the industrial structure in India and also ran new cases for Pakistan with new fuel and electricity prices.

Further refinements will be made to the model in the next quarter. As additional data is collected, the model will be modified for additional countries.

ACTIVITY REPORTS

None.

KEY PERSONNEL

- Hagler, Bailly & Company: Alain Streicher, Vice President; Pirooz Sharafi, Senior Associate.

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$1,932	5,136
Fringe benefits	579	1,540
Overhead	2,384	6,340
Travel/trans./per diem	---	---
Other direct costs	---	5
Equipment	---	---
Subcontractor	---	---
	<hr/>	<hr/>
Total	\$4,895	\$13,021
Fee	---	75
	<hr/>	<hr/>
GRAND TOTAL	\$4,895	13,021

U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Research, Development, and Demonstration

ACTIVITY: Institutional/Policy Barriers to Energy Conservation

COUNTRY: Not country-specific

START DATE: 10/1/85

COMPLETION DATE: Ongoing

BUDGET: \$60,000

QUARTERLY EXPENDITURES: \$15,394

CUMULATIVE EXPENDITURES: \$38,728

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Alain Streicher

HBC REFERENCE: 181

DESCRIPTION

As part of S&T/EY's broader initiative to promote private sector participation in energy activities, ECSP staff continued to identify and analyze the barriers to private investment in energy conservation. During this quarter, a draft report on the barriers to private investment in energy conservation in developing countries was prepared. The objectives of the study were to identify and gain a better understanding of the principal barriers to local and U.S. private investment in energy conservation in AID-assisted countries; increase awareness and stimulate discussion of the barriers; provide AID missions and host governments with a useful framework and "checklist" for identifying and addressing the barriers to private investment in energy conservation in country- and sector-specific situations; identify issues requiring further research; and recommend "next steps" for AID in its efforts to address the barriers to private investment in energy conservation.

To achieve these objectives, ECSP staff performed the following tasks:

- Conducted an extensive review of the energy conservation and private investment literature to identify previous analyses of barriers and prepared a bibliography on general and sector-specific barriers
- Discussed the barriers to energy conservation with numerous experts in the energy conservation and private investment fields
- Developed a classification system for organizing the barriers
- Based upon the literature review and discussions, identified the general and sector-specific barriers and entered them into the classification system, and
- Compiled "checklists" of general and sector-specific barriers, grouped according to the classification system, and cross-referenced to the bibliography.

The preliminary findings of the study are:

- There has been little formal analysis of the barriers to private investment in energy conservation in developing countries
- The barriers can be classified into four broad categories: technical, economic, financial, institutional
- Most of the literature does not explicitly differentiate between general and sector-specific (industry, agriculture, transport, buildings, electric power) barriers to private investment in energy conservation, although some sector-specific barriers were identified
- In general, the barriers to foreign private investment are not energy conservation-specific, and
- Further research and analysis are necessary to help S&T/EY and the Missions work with host governments to seek ways to address the barriers in individual AID-assisted countries.

The draft report is currently being circulated for review and comment. The report will be continually revised and up-dated as comments are received and new information becomes available.

Activities anticipated during the next quarter include:

- Identification of a limited number of institutional/policy barriers for S&T/EY efforts
- Identification of a limited number of target countries for S&T/EY efforts
- Preparation of detailed country case studies on the barriers and incentives to private investment in energy conservation, and
- Development of an S&T/EY strategy for policy/institutional reform in target countries.

ACTIVITY REPORTS

- Energy Conservation in Developing Countries: Identification and Analysis of the Barriers to Private Investment, Draft Report, June 30, 1986.

KEY PERSONNEL

- Hagler, Bailly & Company: Henri-Claude Bailly, President; Alain Streicher, Vice President; Suzanne Leonard, Associate.

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$5,912	\$12,875
Fringe benefits	1,774	3,863
Overhead	7,302	15,902
Travel/trans./per diem	34	3,942
Other direct costs	372	1,102
Equipment	---	---
Subcontractor	---	---
	---	---
Total	\$15,394	\$37,684
Fee	---	<u>1,044</u>
GRAND TOTAL	\$15,394	\$38,728

U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Research Development & Demonstration

ACTIVITY: Innovative Private Sector Financing

COUNTRY: Sri Lanka, Costa Rica, Dominican Republic, Central America, Pakistan

START DATE: 10/15/85 **COMPLETION DATE:** 12/31/86

BUDGET: \$75,000 **QUARTERLY EXPENDITURES:** \$5,171
CUMULATIVE EXPENDITURES: \$21,861

S&T/EY MANAGER: Jim Sullivan

HBC MANAGER: Henri-Claude Bailly **HBC REFERENCE:** 183

DESCRIPTION

ECSP has supported exploratory work in the area of innovative financing of energy conservation projects and has prepared a number of documents outlining these concepts. The next logical step is to identify a private sector project which would lend itself to a demonstration of innovative financing. Previously funded AID work in Costa Rica, Central America, the Dominican Republic, Sri Lanka, and Pakistan could be the source of such a project.

ECSP contractor staff have been exploring with private and public sector officials possible energy conservation projects that would lend themselves to a demonstration of innovative approaches to financing in a number of places. Visits have been made to Sri Lanka, Costa Rica, and the Dominican Republic and discussions have been held with a variety of industries to identify potential projects. Several facilities have expressed considerable interest including tire, candy, and cement companies in Costa Rica, a tire company in Sri Lanka, a steel and two cement companies in the Dominican Republic, and other companies in Pakistan, Thailand, and Egypt.

During this quarter, possible projects were explored during a trip to Costa Rica (see HBC Reference 151 for a description of the trip). Discussions were also held on possible support to the buildings sector in Jamaica, targeted toward improving the energy efficiency of small hotels.

These and other opportunities will be developed further in the next quarter.

ACTIVITY REPORTS

None.

KEY PERSONNEL

- Hagler, Bailly & Company: Henri-Claude Bailly, President; Alain Streicher, Vice-President; Robert Kowalski, Senior Associate, Mark Oven, Senior Associate.

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$1,762	\$7,822
Fringe benefits	529	2,348
Overhead	2,175	9,660
Travel/trans./per diem	606	1,096
Other direct costs	99	653
Equipment	---	---
Subcontractor	---	---
	<hr/>	<hr/>
Total	\$5,171	\$21,579
Fee	<hr/> ---	<hr/> 282
GRAND TOTAL	\$5,171	\$21,861

**U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)**

**QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)**

ACTIVITY AREA: Research, Development & Demonstration

ACTIVITY: Road Transportation Energy Conservation Program
(Contract Task Area 4)

COUNTRY: Costa Rica

START DATE: 6/1/85

COMPLETION DATE: Ongoing

BUDGET: \$130,000

QUARTERLY EXPENDITURES: \$32,737
CUMULATIVE EXPENDITURES: \$138,208

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Alain Streicher

HBC REFERENCE: 178

DESCRIPTION

During this quarter, the final report on the Costa Rica demonstration project, Implementation of Fuel Cost Reduction Measures in Costa Rican Private Bus and Taxi Fleets, was completed. The draft report was circulated for comments and was revised based on reviews received from participating organizations in Costa Rica, the Costa Rica mission, AID/Washington, and Oak Ridge National Laboratory. The data analysis was completed, and conclusions and recommendations were developed. Finally, the Executive Summary was translated into Spanish and sent to the participating organizations in Costa Rica.

The demonstration project applied fuel conservation measures to fleets of 24 buses and 16 taxis. Initial measures included optimum maintenance and radial tires. After 4 weeks all participating drivers were trained in fuel-efficient driving techniques. Following completion of driver training, driver incentives were given to bus drivers while the test continued for an additional four

weeks. Data on kilometers traveled, fuel consumed, routes, drivers, and vehicle types were then collected and analyzed.

The results from the project were very encouraging.

The bus savings were:

Proper maintenance	6.5%
Driver training	4.2%
Driver incentives	1.2%*
Radial tires	-1.8%

The taxi savings were:

Proper maintenance	1.8%*
Driver training	15.1%
Radial tires	0.2%*

*Not statistically significant

The key conclusions reached in the report are as follows:

- The fuel conservation measures were demonstrated to be effective and produced significant savings in the demonstration fleets.
- Driver training was the most effective measure, followed by improved maintenance.
- The project created a local institutional capability for expanding the fuel conservation measures throughout the country.
- The country's vehicle maintenance infrastructure is inadequate to maintain vehicles in optimum fuel-efficient condition. The lack of documentation, equipment and qualified personnel, together with perceived high prices, prevents proper servicing of most of the fleet.

Several components of the project did not perform up to expectations. A number of factors are believed to be responsible, including:

- Bus driver training savings were depressed by training problems (inappropriate gear box and speed limit) and late completion of driver training.
- Bus driver incentives were diluted by their late introduction, and by the fact that many of the buses designated for this treatment were

driven partly by owners' relatives, to whom the incentives were not applied.

- Taxi maintenance savings were less than expected since most of the taxis were late model cars in good condition to begin with. In addition, several taxis failed to use the designated service station.

The key recommendations reached in the report are as follows:

- The experience gained in the project shows that such training and improved maintenance programs are cost effective and should therefore be expanded to all intensively-operated vehicles nationwide (taxis, buses, and trucks), with priority given to improved truck maintenance and truck driver training. This program should include: performing energy audits of major transportation energy users; establishing a permanent driver training system; and upgrading the country's diesel maintenance infrastructure, among other things.
- Follow-up surveys of the two fleets should be undertaken to determine the long-term impact.
- The National Chamber of Transport should promote fuel cost reduction actions and adoption of a uniform operating data recording and analysis system by its associates, and the repair of all odometers to register distance traveled.
- Empresa Guadalupe, the bus cooperative, should take the following actions to improve maintenance and fleet management systems: Establish an optimal bus maintenance standard and provide adequate in-house facilities, equipment and staff, together with outside contractors, to maintain that standard; negotiate contracts with qualified outside shops for maintenance service beyond the scope of its own shop; and improve operations data collection systems to provide more accurate data.
- Finally, the experience gained in this project should be used for developing similar demonstration and public information projects in other countries.

As a follow-on activity to the Costa Rica demonstration project, ECSP staff continued work on a policy paper to evaluate transportation energy conservation projects in developing countries. The first draft of this report, Road Transportation Energy Conservation: Needs and Options in Developing Countries, was prepared in this quarter and will be distributed for review early in July.

Experience in transportation energy conservation in developing countries has been very limited. As a result, information for making reasoned choices of new projects is very limited. This report is designed to help alleviate the situation by summarizing developing country experience with transportation energy conservation measures, evaluating the potential for conservation, and evaluating individual conservation measures to choose those most appropriate for developing countries. The report is designed to serve as a reference document to facilitate choosing transportation energy conservation projects for developing countries. To this end, ECSP staff performed the following tasks:

- Conducted an extensive search for examples of transportation energy conservation efforts in developing countries, evaluated the projects found, and created a series of case studies
- Discussed the importance of increasing energy efficiency in transportation
- Analyzed an extensive set of statistics to identify countries with the greatest need and showing the greatest promise for transportation energy conservation projects
- Identified all transportation energy conservation measures and developed a classification system to facilitate understanding and evaluating these measures
- Evaluated transportation energy conservation measures to select the most appropriate and promising measures for developing countries
- Evaluated the impact of individual transportation energy conservation measures and estimated the potential impact of concerted efforts to improve the energy efficiency of the transportation sector
- Conducted an extensive literature search and created a bibliography to identify some of the more important reports and books on transportation energy conservation.

The final report will include a listing of transportation energy conservation experts and companies that have experience in the field.

The preliminary findings indicate that there has been very little direct experience on transportation energy conservation measures in developing countries. Developed countries, however, have had extensive experience and conclusions can be drawn from their experience about the relevance of certain measures. Based on the experiences in both developed and developing countries, the report identifies the most promising conservation measures and indicates the countries with the greatest need and potential.

The report will be distributed for review in the next quarter and the final report will be drafted.

ACTIVITY REPORTS

- Implementation of Fuel Cost Reduction Measures in Costa Rican Private Bus and Taxi Fleets, Final Report, June 11, 1986.
- Road Transportation Energy Conservation: Needs and Options in Developing Countries, Draft Report, June 30, 1986.

KEY PERSONNEL

- Hagler, Bailly & Company: Alain Streicher, Vice President; Robert Kowalski, Senior Associate; Jeff Erickson, Associate
- Oak Ridge National Laboratory: Dr. David Greene
- USAID/San Jose: Heriberto Rodriguez, Energy Officer
- Costa Rica: Ministry of Industry Energy and Mines, Energy Sector Directorate: Dr. Jorge Blanco, Director General; Lic. Ana Lorena Leon, Manager; Ing. Antony Araya.

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$10,626	\$36,382
Fringe benefits	3,188	10,915
Overhead	13,123	44,933
Travel/trans./per diem	1,619	20,924
Other direct costs	4,181	13,691
Equipment	---	---
Subcontractor	---	<u>5,871</u>
Total	\$32,737	\$132,716
Fee	---	<u>5,492</u>
GRAND TOTAL	\$32,737	\$138,208

USAID/San Jose has contributed \$30,000 to this task.

U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Research, Development, and Demonstration

ACTIVITY: Technology Transfer for Energy Management

COUNTRY: Egypt

START DATE: 10/1/85

COMPLETION DATE: 10/31/86

BUDGET: \$250,000

QUARTERLY EXPENDITURES: \$0

CUMULATIVE EXPENDITURES: \$0

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Henri-Claude Bailly

HBC REFERENCE: 187

DESCRIPTION

The Technology Transfer for Energy Management project's ultimate goal is to conserve energy use among conventional energy users in Egypt, thereby providing increased foreign exchange earnings through increased oil exports. Additionally, the activity seeks to establish a strong institutional capacity to undertake and manage conservation-related investments and programs. This capacity will be developed among energy consumers, suppliers of equipment and services, lenders, and government policy-makers.

ECSP staff attended a series of meetings with the AID Mission in Washington DC to make preparations for work to start in the fourth quarter.

ACTIVITY REPORTS

None.

KEY PERSONNEL

- Hagler, Bailly & Company: Henri-Claude Bailly, President; Alain Streicher, Vice President; Jack Stafurik, Senior Associate
- USAID/Cairo: Lawrence Ervin.

EXPENDITURES

Expenditures during this quarter for this task are included in HBC Reference 150/151.

The USAID Mission in Cairo will be contributing approximately \$250,000 for the project.

U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Research Development & Demonstration

ACTIVITY: India Purpa Study

COUNTRY: India

START DATE: 4/29/86

COMPLETION DATE: Ongoing

BUDGET: \$85,252

QUARTERLY EXPENDITURES: \$6,378

CUMULATIVE EXPENDITURES: \$6,378

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Alain Streicher

HBC REFERENCE: 199

DESCRIPTION

This activity was created as a separate job code after work was begun under the Private Sector Involvement in Non-Utility Power Generation activity (HBC Reference 179) in order to keep close budgetary control on this specific job. The project team will examine the impediments to and potential for non-utility electrical generation primarily in the private sector in two states in India, Maharashtra and Gujarat. They will also examine current central government policies, plans and authority and the interaction between the two states and central entities. The team will visit with key power sector, private sector, and government policy officials to determine their views, collect and analyze existing data and information, and debrief the mission and the Government of India on findings and recommendations.

The study has three objectives:

- Preliminary identification of the economic and financial potential for cogeneration and private sector power production from renewable and indigeneous resources.

- Identification of the policy, regulatory, institutional, and other impediments to non-utility private sector electrical generation from cogeneration or renewable/indigenous resources for sale to the grid.
- Development of recommendations and an action plan for addressing the impediments to non-utility generation.

During this quarter, preliminary meetings with AID's Office of Energy and the Bureau for Asia and the Near East were held and the budget was firmed up. The ECSP team gathered material, attended meetings and briefings, and began to structure the model for cogeneration. Discussions were held about including specialized seminars on PURPA for the India AID mission and interested Indian organizations. Discussions with the Technology Transfer Team (see HBC Reference 184) indicated that the scope of work should be revised to include an examination of the market for cogeneration in the commercial sector. This will be examined in the next quarter. After several delays, clearance was gained and work will begin in country in late July.

ACTIVITY REPORTS

None.

KEY PERSONNEL

- Hagler, Bailly & Company: Alain Streicher, Vice-President; Pirooz Sharafi, Senior Associate; Jack Stafurik, Senior Associate.

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$1,621	\$1,621
Fringe benefits	487	487
Overhead	2,002	2,002
Travel/trans./per diem	13	13
Other direct costs	255	255
Equipment	---	---
Subcontractor	<u>2,000</u>	<u>2,000</u>
Total	\$6,378	\$6,378
Fee	<u>---</u>	<u>---</u>
GRAND TOTAL	\$6,378	\$6,378

U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Training and Field Technical Assistance

ACTIVITY: General Field Technical Assistance
(Contract Task Area 6)

COUNTRY: Thailand, Indonesia

START DATE: 10/16/85 **COMPLETION DATE:** 9/30/87

BUDGET: \$140,000 **QUARTERLY EXPENDITURES:** \$4,319
CUMULATIVE EXPENDITURES: \$65,537

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Alain Streicher **HBC REFERENCE:** 182

DESCRIPTION

Indonesia

During the previous quarter, ECSP staff reviewed energy conservation activities for Indonesia and discussed possible ECSP involvement in 1986. The discussion centered on initiating a program to train 30-35 senior plant engineers, mostly from the private sector, in energy demand management and energy auditing techniques, in order to enable them to reduce some of their energy costs in the short term. No progress was made on this seminar during this quarter. Further discussions are expected in the next quarter to advance this proposal.

Thailand

During the previous quarter, ECSP provided support to the government of Thailand in its efforts to accelerate energy conservation in all sectors of the economy. This support has focused on two areas in which NEA and NESDB urgently needed the "quick response," specialized type of assistance offered by ECSP. Work in the first area, dealing with establishing medium-term national energy saving goals and targets for the industrial sector, produced the draft final report: Kingdom of Thailand: The National Energy Saving Goals for Industry, 1986-1991. Work in the second area, related to the establishment of the private energy conservation center of Thailand, produced the draft final report: Kingdom of Thailand: The National Energy Conservation Center: A Mobilization Plan.

This quarter, an AID official, while in Thailand discussing the upcoming Bangkok conference (see HBC Reference 185), discussed the two studies with Thai officials. They concluded that the studies were very useful and ECSP will finalize them for distribution in the next quarter. Followup activities will be discussed during the Bangkok conference (see HBC reference 185).

ACTIVITY REPORTS

None.

KEY PERSONNEL

- Hagler, Bailly & Company: Alain Streicher, Vice President; Bruce Appelbaum, Senior Associate ; Robert Kowalski, Senior Associate; John Armstrong, Senior Associate
- AID/Washington: Robert Archer and Robert Ichord, A/NE; David Jhirad, S&T/EY
- AID/Bangkok: John Neave, Energy Officer
- AID/Jakarta: Desmond O'Riordan, Energy Officer
- Thailand: Prapath Premani, Secretary General, and Dr. Itthi Bijayendrayodhin, Energy Economics Division, National Energy Administration
- Indonesia: Dr. A.J. Surjadi, Director for New Energy Development, Ministry of Mines and Energy.

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$201	\$17,338
Fringe benefits	60	5,201
Overhead	247	21,412
Travel/trans./per diem	522	13,312
Other direct costs	1,289	5,306
Equipment	---	---
Subcontractor	---	---
	<hr/>	<hr/>
Total	\$2,319	\$62,569
Fee	---	968
	<hr/>	<hr/>
GRAND TOTAL	\$2,319	\$63,537

U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Information Exchange

ACTIVITY: Technology Transfer Teams for Energy Conservation
(Contract Task Area 6)

COUNTRY: Not country-specific

START DATE: 10/16/85 **COMPLETION DATE:** 9/30/87

BUDGET: \$50,000 **QUARTERLY EXPENDITURES:** \$10,016
CUMULATIVE EXPENDITURES: \$23,572

S&T/EY MANAGER: Jim Sullivan

HBC MANAGER: Henri-Claude Bailly **HBC REFERENCE:** 184

DESCRIPTION

Technology Transfer Teams (TTT) will be comprised of technical personnel from private U.S. firms with experience in selected technologies and interest in business promotion and technology transfer to developing countries. These teams will be sent to developing countries to identify and implement projects for a specific technology. The technology being considered initially for transfer is cogeneration. When a technology transfer team is on mission to a country, it will also identify opportunities and constraints to the transfer of that technology. Team activities will include the design of any information dissemination initiatives, marketing, and training efforts necessary for the efficient transfer of a specific technology. Also, team members will be used to monitor the progress of transfer measures and changes in the investment climate that might affect the eventual transfer of the technology.

During this quarter, the Technology Transfer Team had its second formal meeting. ECSP staff and officials from AID and private U.S. companies interested in promoting technology transfer to developing countries met in

Washington, DC on June 24, 1986 to explore, discuss, and decide upon the most appropriate ways for U.S. companies to participate in the emerging cogeneration markets, especially in Asia.

The meeting began with a presentation on the cogeneration market in AID-assisted countries (Pakistan, Thailand, Indonesia, Dominican Republic, Ecuador, and Costa Rica). The presentation was based, in large part, upon the findings of the AID-sponsored assessments of cogeneration and private sector power production potential, impediments and policy issues in Pakistan and Thailand.

The major constraint to U.S. private sector participation in cogeneration markets that was identified by TTT members is the difficulty U.S. equipment manufacturers have competing in overseas markets. U.S. components have not been price competitive. All agreed that American companies face particularly stiff competition from the Japanese and West Europeans, especially in the market for larger power systems. The higher cost of U.S. equipment is partly due to the higher cost of manufacturing in the U.S., and partly due to governmental subsidies and special financing support by competitor countries in Europe and the Far East.

TTT members discussed steps that could be taken to improve the competitiveness of U.S. companies, including focusing on either smaller, "packaged" power systems or forming joint ventures to minimize the installed costs of medium- to large-scale power systems, improving private sector access to innovative financing, and receiving better market and project information.

TTT members expressed a strong interest in participating in the upcoming joint S&T/EY and Bureau for Asia/Near East Bangkok workshop on Energy Conservation and Private Power Generation (see HBC Reference 185). The workshop would give U.S. companies an excellent opportunity to express their views, make contacts, and gain exposure in the Asian cogeneration markets. Following the conference, TTT members may visit and evaluate potential projects in Thailand and Pakistan, and meet with key AID staff, local government officials and industrialists.

During the next two quarters, ECSP staff will obtain additional market information and specific feasibility studies will be carried out for industrial cogeneration projects, with a special focus on Pakistan.

In October, based on the results of the Bangkok workshop (see HBC Reference 185) and the feasibility studies in Pakistan, the agenda and date for the next meeting of the TTT will be set. The World Bank is looking for new, less traditional ways of financing investments in energy, a representative will be invited to present their new policies at the next TTT meeting. In addition, an international financing executive and a congressional staff person with knowledge of foreign trade policies and incentives may be invited.

ACTIVITY REPORTS

Cogeneration Technology Transfer Team Meeting, Briefing Book, June 24, 1986.

KEY PERSONNEL

- Hagler, Bailly & Company: Henri-Claude Bailly, President; Alain Streicher, Vice-President; Peter Bos, Consultant; Suzanne Leonard, Associate
- Technology Transfer Team:
 - Les Casterline, Cooper Industries-Energy Services
 - Thomas W. Gardner, Cooper Industries-Energy Services
 - Robert M. Herzog, Remtech
 - John E. Kadas, Turbodyne Division-Dresser Industries
 - Lazaros J. Lazaridis, Thermo Electron Corp. International
 - Robert D. McFarren, Stone & Webster Engineering Corp.
 - Arthur C. Rolfe, The Garrett Corp.
 - Jay Ryder, Catalyst Energy Development Corporation
 - Kerry Sachs, Agro Power International
 - James M. Tooher, Cogenic Energy Systems, Inc.
- AID/Washington: Jim Sullivan, S&T/EY; Robert Archer, Bureau for Asia & Near East.

EXPENDITURES(As of 6/30/86, based on labor costs incurred and invoices received¹):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$3,140	\$4,721
Fringe benefits	942	1,416
Overhead	3,876	5,827
Travel/trans./per diem	15	102
Other direct costs	300	341
Equipment	---	---
Subcontractor	<u>1,743</u>	<u>10,835</u>
Total	\$10,016	\$23,242
Fee	<u>---</u>	<u>330</u>
GRAND TOTAL	\$10,016	\$23,572

¹These figures do not reflect some work performed by subcontractors but not billed yet. These charges will be reflected in next quarter's report.

U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Information Exchange

ACTIVITY: Regional Energy Conservation Workshops/Seminars:
Asia-Near East Workshop -- Energy Conservation and Private Power
Generation: Promotion and Investment
(Contract Task Area 4)

COUNTRY: Asia-Near East Region

START DATE: 10/15/85 **COMPLETION DATE:** Ongoing

BUDGET: \$120,000 **QUARTERLY EXPENDITURES:** \$11,261
CUMULATIVE EXPENDITURES: \$12,126

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Alain Streicher

HBC REFERENCE: 185

DESCRIPTION

Planning continues for the Asia/Near East regional workshop patterned after the Latin America/Caribbean Regional Energy Conservation Seminar which was held in Costa Rica in January 1985. During the quarter it was decided to hold the workshop from September 29th through October 3rd. The workshop will be held in Bangkok, Thailand at the Asian Institute of Technology.

The objectives of the workshop are to expand private sector participation and investment in energy conservation and power generation, to strengthen AID energy conservation project design, and to identify key factors for successful project implementation. Also during the quarter a draft agenda was prepared and cabled to AID missions in the region.

The following are the main topics to be covered:

- Day 1 -- Introduction
Presentations on AID-assisted energy conservation projects in Thailand, Pakistan, the Philippines, and Egypt
- Day 2 -- Energy Conservation: Price Uncertainty & Policy Issues
Conservation Opportunities in Buildings, Transportation, Agriculture, and Power Sector
- Day 3 -- Fostering Private Sector Investment in Energy Conservation
- Day 4 -- Private Sector Investment in Power Generation
- Day 5 -- Optional field trip.

Speakers and panelists have been selected and invited to participate and will include AID Washington and Mission energy staff, government and private officials from countries with AID projects, ECSP contractor staff, and representatives from the ECSP Cogeneration Technology Transfer Team (see HBC Reference 184). These representatives from the U.S. private sector will describe their experiences with energy conservation, cogeneration, and private power generation activities in the U.S. and abroad. There will also be an opportunity for these U.S. manufacturers to present information on their companies and products.

There will be a catalog show where U.S. equipment vendors will present information on U.S.-manufactured energy efficiency, cogeneration, and small-power equipment. All companies that have been listed in the three editions of the ECSP Energy Equipment Cost Directory have been invited to send catalogs to Bangkok for the show.

Ten AID missions in have indicated an interest in sending people to the workshop, including Egypt, India, Indonesia, Jordan, Morocco, Pakistan, the Philippines, Sri Lanka, Thailand, and Tunisia.

ACTIVITY REPORTS

None.

KEY PERSONNEL

- Hagler, Bailly & Company: Henri-Claude Bailly, President; Alain Streicher, Vice President; Jean-Louis Poirier, Manager; Michael Fisher, Manager; Jack Stafurik, Senior Associate; Pirooz Sharafi, Senior Associate; Steven Fischer, Senior Associate; Gerald Schwinn, Associate; Jeff Erickson, Associate; Suzanne Leonard, Associate
- USAID/Washington: Robert Archer and Robert Ichord, A/NE; James Sullivan and David Jhirad, S&T/EY.

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$4,115	\$4,453
Fringe benefits	1,235	1,337
Overhead	5,081	5,499
Travel/trans./per diem	643	643
Other direct costs	187	191
Equipment	---	---
Subcontractor	---	---
Total	\$11,261	\$12,123
Fee	---	3
GRAND TOTAL	\$11,261	\$12,126

The Asia/Near East Bureau will contribute approximately \$60,000 to this activity.

U.S. AID CONSERVATION SERVICES PROGRAM
(Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
(For period 4/1/86-6/30/86)

ACTIVITY AREA: Information Exchange

ACTIVITY: Information Exchange and Energy Conservation Network
 Development (Contract Task Area 5)

COUNTRY: Not country-specific

START DATE: 10/15/85* **COMPLETION DATE:** Ongoing

BUDGET: \$75,000 **QUARTERLY EXPENDITURES:** \$9,932
CUMULATIVE EXPENDITURES: \$21,995

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Gerald Schwinn **HBC REFERENCE:** 186

DESCRIPTION

In order to monitor the many information activities of ECSP, we have established this separate task. It is here that we report on the number of publications, as well as the ECPIE Model and other computer products, requested and distributed. Exhibit 5 shows the requests through this quarter for publications and the ECPIE Model. Since the inception of the program, 55 reports, presentations, manuals, and other papers have been prepared (not including some working papers and memorandum). A comprehensive list is provided in Appendix 1.

During this quarter, the fourth issue of Update, describing activities in the Energy Conservation Services Program, was finalized, printed, and distributed. Initial plans for the next issue were developed.

*This date only represents the origination of this activity as a separate task for accounting purposes; the activities described under this task have been on-going since the inception of the contract and were previously included under HBC Reference 150/151, General Program Management.

A form was included with Update requesting that all recipients confirm their interest in remaining on the mailing list and provide the names of other individuals who should be informed about ECSP activities. Exhibit 6 shows the response to date. The total ECSP international mailing list now includes 556 individuals.

Planning and discussion have taken place on holding a meeting during the Regional Energy Conservation Workshop in Bangkok (see HBC Reference 185) to consider the formation of a regional energy managers association or at least to encourage greater interaction among the existing and planned groups in Sri Lanka, the Philippines, and Pakistan.

Finally, as part of its information dissemination activities, ECSP staff drafted an article on AID energy conservation activities for AID's Frontline newsletter.

ACTIVITY REPORTS

- Energy Conservation Services Program: Update No. 4, April 1986.

KEY PERSONNEL

- Hagler, Bailly & Company: Henri-Claude Bailly, President; Alain Streicher, Vice President; Gerald Schwinn, Associate; Jeff Erickson, Associate; Beverly Abreu, Research Associate.

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$2,528	\$6,632
Fringe benefits	759	1,990
Overhead	3,149	8,218
Travel/trans./per diem	40	40
Other direct costs	3,456	5,115
Equipment	---	---
Subcontractor	---	---
	<hr/>	<hr/>
Total	\$9,932	\$21,995
Fee	<hr/> ---	<hr/> ---
GRAND TOTAL	\$9,932	\$21,995

Exhibit 5

Requests for ECSP Publications and Computer Products

<u>TITLE</u>	<u>SOURCE OF REQUEST</u>				
	<u>USAID STAFF</u>	<u>USAID \</u> <u>PROJECT STAFF</u>	<u>PRIVATE SECTOR U.S.</u>	<u>PRIVATE SECTOR ABROAD</u>	<u>OTHER DONOR AGENCIES</u>
Energy Demand Management & Conservation Manual	7	4	3	3	1
Industrial Energy Audit Manual	10	7	2	3	1
ECPIE	7	7	4	2	1
Latin America & Caribbean Regional Energy Conservation Seminar - Paper	3	7	1	3	1
Conclusions & Recommendations of the Latin America & Caribbean Energy Seminar	4	3			1
Energy Equipment Cost Directory	3	4	1	2	1
Transportation Sector in Costa Rica & Opportunities for Energy Conservation	4	5	1	1	
Financing Energy Conservation in Developing Countries	5	3	4	2	1
Cogeneration in Developing Countries: Prospects and Problems	3		2	1	

Exhibit 6: Mailing List

Requests to Remain On or Be Added to
the ECSP Mailing List
Through June 30, 1986

Location	1. United States			2. International Organizations		
	USAID (a)	Other US Gov't (b)	US Private (c)	Int'l Org. (a)	Gov't (b)	Private Sector (c)
Austria						
Barbados				1		
Belgium				1		
Bolivia	1					
Burma	1					2
Cameroon	1				2	
Canada						
Cape Verde	1					1
Chile						
Costa Rica				1		
Dominican Republic	1					3
France					1	1
Ghana				1		
India	1				2	
Indonesia						1
Italy					2	
Jamaica				1		
Luxembourg					1	
Mauritania	1			1		
Nouakchott		1				
Pakistan						
Philippines	1			1	3	2
Salvador					1	2
Singapore					2	1
Sri Lanka					1	
Switzerland					5	2
Thailand				2		
United Kingdom					1	
United States	4	3	8	1	1	2
Zimbabwe				6		
					1	
Subtotals	12	4	8	16	22	17
Total	79					

U.S. AID CONSERVATION SERVICES PROGRAM
 (Contract Number: DAN-5728-C-00-3073-00)

QUARTERLY ACTIVITY REPORT
 (For period 4/1/86-6/30/86)

ACTIVITY AREA: General Program Management

ACTIVITY: Program Management and Development

COUNTRY: Not country-specific

START DATE: 9/15/83

COMPLETION DATE: Ongoing

BUDGET: None

QUARTERLY EXPENDITURES: \$60,697

CUMULATIVE EXPENDITURES: \$429,068

S&T/EY MANAGER: Alberto Sabadell

HBC MANAGER: Henri-Claude Bailly

HBC REFERENCE: 150/151

DESCRIPTION

This activity consists of the various management tasks associated with the execution of the contract -- e.g., progress review meetings, preparation of quarterly reports. It also includes planning activities associated with new initiatives. These initiatives are either triggered by the field, the regional bureaus, or directly by S&T/EY. (Some of these activities eventually become separate activities for program management purposes.) The third-quarter activities for the third year of ECSP (in addition to those that are already treated as separate program activities) are described below:

- **Power Plant Rehabilitation:** The purpose of this study is to: (1) evaluate the potential for and impediments to power system rehabilitation; and (2) identify the role of AID, if any, in promoting power system rehabilitation as a way to increase the generation supply capacity in developing countries.

During this quarter, the ECSP staff first estimated the rehabilitation potential in the following countries:

Asia: Bangladesh, India, Indonesia, Pakistan, the Philippines, and Thailand

Africa: Egypt, Morocco, Senegal, Somalia, and Zambia

Latin America and Caribbean: Costa Rica, Guatemala, Haiti, and Honduras

The preliminary results of this study indicate that it is possible to increase the thermal power generation capacity in these countries by over 4,000 MW through various rehabilitation measures. This represents over 10 percent of the existing thermal generation capacity. The financial cost of this improvement will be only a fraction of the cost of building new generation units. To achieve this potential, the electric utilities in these countries must undertake a comprehensive program of equipment upgrading, operator training, improved operation planning, and preventive maintenance.

The study team also examined the potential market for U.S. manufacturers in power system rehabilitation in the countries studied. The team reviewed the existing literature on the design and structure of power plants in these countries, conducted in depth interviews with engineering and consulting firms with experience in these countries, and directly contacted the utilities. The team learned that over 70 percent of power system hardware in these countries is manufactured outside the U.S., which limits the potential market for U.S.-made parts and equipment.

Nevertheless, the study indicated that there is a growing market for U.S. services, such as operations planning, spare parts management, training, data gathering, and management improvement, which compose a substantial part of any successful power system rehabilitation strategy.

During the next quarter, the study team will review the strategies of the World Bank and other international development institutions for power system rehabilitation in developing countries in general, and the above 15 countries in particular. The purpose of this review is to identify measures that have been effective and develop a policy for AID.

- **Cogeneration in Developing Countries: Prospects and Problems:** During this quarter, the white paper on cogeneration was finalized and distributed. Additional comments and suggestions from the Office of Energy and the Bureau for Asia and the Near East were

incorporated to prepare the final report. This study also supplemented planning efforts for cogeneration activities in Pakistan, Thailand, and India (see HBC Reference 179 and 199).

The report estimates cogeneration's potential in developing countries and discusses the economic, technical, and institutional factors that determine the decision of a government, a firm, or a foreign manufacturer to get involved in cogeneration. It also identifies public policy initiatives that can encourage the application of cogeneration technologies as a means of improving economic efficiency. And finally, it discusses the role of AID in promoting private-sector involvement in cogeneration development.

The report estimates that in many countries, cogeneration systems can provide over 10 percent of the generation capacity with modest additional capital expenditures. Cogeneration could provide between 6 and 10 gigawatts of electric power for AID-assisted developing countries, mainly in the commercial and industrial sectors.

According to the report, three major issues govern the development of cogeneration: technical, economic and financial, and institutional. Technical issues such as system engineering and selection, procurement, installation, and operation and maintenance are fairly straightforward. In this area, AID can stimulate the development of cogeneration projects by providing information and train engineers and plant personnel.

The report addresses economic and financial issues by presenting some preliminary analyses of cogeneration systems in several countries. Based on current electricity and fuel prices, these analyses indicate that countries such as Egypt, Indonesia, Pakistan, Bangladesh, Thailand, and Korea can produce electricity from selective modular cogeneration systems at a cost less than utility prices. In the Philippines, India, and Turkey the situation is not so clear cut, but cogeneration would be economical in some cases.

The regulatory and institutional setting in developing countries has a very important impact on the private-sector's role in developing cogeneration systems. The interaction between utilities and cogenerators, in particular, requires special attention. Regulations and procedures must be established to allow private parties to sell power to utilities. In addition, procedures need to be developed to determine a fair price for power purchased by utilities from private cogenerators.

The report identifies activities that AID can support to further encourage the development of cogeneration projects. These include

facilitating policy dialogue, supporting research, development, and demonstration, and encouraging information dissemination.

- **Dominican Republic:** In response to a request from the National Energy Policy Commission to the AID Mission in the Dominican Republic, ECSP submitted detailed proposals, based on its mission in the previous quarter, to carry out activities in transportation energy and cogeneration. The study objectives will be: 1) to develop a comprehensive diagnosis of the current and expected energy consumption in the transport sector, and identify policy options for energy efficiency improvement; and 2) to provide an estimate of the potential for industrial cogeneration, identify constraints/impediments to its development, and recommend policy initiatives to stimulate it. Agreement on the proposal was reached and arrangements were made to begin work during the fourth quarter.
- **Bolivia:** In response to a request from the AID mission in Bolivia, ECSP staff prepared a package of materials describing the energy conservation activities and services of ECSP. The Bolivian Mission is exploring the possibility of establishing an energy conservation program.
- **Morocco:** The AID mission in Morocco wants to initiate an energy demand management program with help from ECSP. A meeting was held on May 15, 1986 with the AID/Morocco energy officer to discuss the prospects. It was decided that Hagler, Bailly & Company will collaborate on the project and tentative plans call for a meeting in October to develop a program of action.
- **Energy Equipment Cost Directory:** The third revision of the ECSP Energy Equipment Cost Directory was completed during this quarter. It will be distributed during the next quarter.
- **ECPIE:** Under a non-ECSP AID program (the Enercon project in Pakistan), Hagler, Bailly & Company staff have revised the Energy Conservation Project Investment Evaluation Model (ECPIE) originally created under ECSP. The revised Model has been used to train energy managers in Pakistan.
- **Costa Rica:** At the request of AID/San Jose, ECSP staff visited Costa Rica to identify possible follow-up energy conservation activities. The new government, and particularly the minister of the newly established Ministry of Natural Resources, Energy and Mines, Dr. Alvaro Umana, is placing top priority on programs to conserve energy and natural resources as well as capital. As a result of interviews conducted with the Minister, his staff, other

government officials (including representatives of the Instituto Costarricense de Electricidad), representatives of the private sector and AID officials, four areas for Mission funding consideration have been identified:

- 1) Electric load management, i.e. transferring U.S. techniques and know-how to reduce peak demand
- 2) Private-sector power generation, i.e. developing policies and legislation to allow the private sector to generate power
- 3) Energy cost reduction in inter-city transport, i.e. trucks and buses
- 4) Assistance in energy efficiency project implementation in the industrial sector, including securing appropriate financing.

The first two areas are of greatest interest to the Government and the mission due to their potential to delay, reduce, or eliminate costly new capital-intensive hydro or geothermal power plants and improve the overall public finance situation while stimulating private investment and initiatives.

ECSP staff began drafting a proposal on these areas in this quarter. It will be reviewed by S&T/EY for submission to the Mission and the Government of Costa Rica and decisions on these programs are expected to be made in the next quarter.

- **Guatemala:** After visiting Costa Rica, ECSP staff stopped in Guatemala to meet with personnel from the AID Regional Office for Central America and Panama (ROCAP) and discuss the status of the original Industrial Energy Efficiency project implemented by ICAITI and SIECA. Discussions were held with ROCAP to identify possible areas of collaboration between ECSP and other programs in the region, especially the Los Alamos energy initiative.
- **Power for Rural Development: A Strategy:** During this quarter, ECSP staff assisted in the preparation of a draft strategy on power for rural development. The draft strategy discusses rural energy needs and options, the barriers to meeting rural energy needs, AID's role in overcoming the barriers, and proposed initiatives to ensure adequate, reliable and affordable rural energy supplies. The objectives of the strategy are to remove energy-related barriers to rural development and to promote private sector participation in rural power in AID-assisted countries by developing new rural energy supplies and improving the management and efficiency of existing rural energy systems.

During the next quarter the strategy paper will be completed and candidate projects identified.

- **Research Tasks:** In response to requests from the Office of Energy, ECSP staff undertook several short research efforts: 1) ECSP staff conducted a survey to identify U.S. utilities that are providing or might be interested in providing management and engineering services in the power sector to AID-assisted countries. During the initial stages of the survey, several utilities with on-going programs were identified, as well as utilities interested in providing services to developing countries. The initial findings will be sent to AID during the next quarter; 2) ECSP staff prepared a list of AID-supported energy conservation initiatives in developing countries. This list of 40 activities was broken down by country and included the project title, sector of activity, and a short description of the activity; 3) To support AID's presentations at the Energy Research Donors Meeting in Germany, ECSP staff drafted a report on energy conservation R&D needs.

ACTIVITY REPORTS

- Energy Conservation Services Program: Second Quarterly Report, FY1986 1/1/86-3/31/86, April 30, 1986.
- Cogeneration in Developing Countries: Prospects and Problems, May 5, 1986.
- Energy Equipment Cost Directory, Third Edition, June 1986.
- Power for Rural Development: A Strategy, First Draft, June 1986.
- Dominican Republic, Technical Assistance to the National Energy Policy Commission: Proposal for Studying Transport Sector Energy Use and Industrial Cogeneration, April 11, 1986.

KEY PERSONNEL

- Hagler, Bailly & Company: Henri-Claude Bailly, President; Alain Streicher, Vice President (7 days in Costa Rica, 2 days in Guatemala); Pirooz Sharafi, Senior Associate; Bruce Appelbaum, Senior Associate; Gerald Schwinn, Associate; Bruce Exstrum, Associate; Jeff Erickson, Associate; Suzanne Leonard, Associate

EXPENDITURES

(As of 6/30/86, based on labor costs incurred and invoices received):

	<u>This quarter</u>	<u>Cumulative</u>
Salaries	\$20,934	\$136,612
Fringe benefits	6,280	39,310
Overhead	25,856	166,971
Travel/trans./per diem	1,117	8,155
Other direct costs	6,510	53,240
Equipment	---	---
Subcontractor	---	4,745
	<hr/>	<hr/>
Total	\$60,697	\$409,033
Fee	---	20,035
	<hr/>	<hr/>
GRAND TOTAL	\$60,697	\$429,068

APPENDIX 1: PUBLICATIONS

ECSP ANNUAL AND QUARTERLY REPORTS

FY84:	First	9/15/83 - 12/15/83	January 12, 1984
	Second	12/15/83 - 4/1/84	May 11, 1984
	Third	4/2/84 - 6/30/84	July 25, 1984
	Fourth	7/2/84 - 9/28/84	October 31, 1984
	Annual Report	9/15/83 - 9/28/84	April 25, 1985
FY85:	First	10/1/84 - 12/31/84	February 9, 1985
	Second	1/1/85 - 3/31/85	May 2, 1985
	Third	4/1/85 - 6/30/85	August 1, 1985
	Fourth	7/1/85 - 9/30/85	October 30, 1985
FY86:	First	10/1/85 - 12/31/85	February 7, 1986
	Second	1/1/86 - 3/31/86	April 30, 1986
	Third	4/1/86 - 6/30/86	July 21, 1986

ECSP UPDATE

- Number 1, June 1984
- Number 2, November 1984
- Number 3, July 1985
- Number 4, April 1986

REPORTS

150/151 Program Management and Development

ECPIE: An Energy Conservation Project Investment Evaluation Model
(Paper presentation on the model for the Sri Lanka Symposium on
"Microcomputers for Developing Countries," October 31, 1984.

Programme de Cooperation Pour les Economies d'Energie, French
version of the ECSP brochure, Spanish version produced as well.
November or December 1984.

Energy Equipment Cost Directory, Third Edition, June 1986.

Elements of a Strategy for the United States Agency for International
Development in the Area of Energy Conservation, Draft report and
appendix, March 1985.

Financing Energy Conservation in Developing Countries, Draft, June 12,
1985.

PUBLICATIONS

2-43-
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Cogeneration in Developing Countries: Prospects and Problems, May 5, 1986.

Strategy and Program Plan for Energy Conservation FY86 and FY87, October 1985.

Memorandum on energy conservation information centers in the U.S., February 24, 1986.

157 Energy Conservation Project Investment Evaluation Model (ECPIE)

The Energy Conservation Project Investment Evaluation Model (ECPIE): A User's Manual, March 1985.

161 Transportation Energy Conservation

Revised Draft Report of the Transportation Energy Conservation Reconnaissance Mission to Costa Rica June 3-16, 1984, prepared by David Greene and Frank Southworth, Oak Ridge National Laboratory, and Robert Kowalski, December 31, 1984.

162 Seminario Sobre la Conservacion de Energia

Seminario sobre la Conservacion de Energia/Energy Conservation Seminar, Papers, January 1985.

Conclusions and Recommendations of the Latin America and Caribbean Regional Energy Conservation Seminar, (Seminario sobre la Conservacion de Energia), March 29, 1985.

Conclusiones y Recomendaciones del Seminario Regional de America Latina sobre la Conservacion de Energia, Draft Spanish version of the report referenced above, June 1985.

168 Organization and Planning of a Pakistan National Energy Conservation Center

Organization and Implementation Plan for the Energy Conservation Center, Draft Discussion Paper for Pakistan, October 8, 1984.

Energy Conservation in Pakistan: First Draft and Supporting Analysis, November 15, 1984.

Presentation on Energy Conservation to the Energy Policy Board, by Dr. Donor M. Lion, Mission Director, February 11, 1985.

Development of a Model to Estimate Pakistan's Energy Conservation Potential, Draft Discussion Paper, January 18, 1985.

National Energy Conservation Program, Vol. I, April 21, 1985.

National Energy Conservation Program, Vol. 2: Supporting Data and Analysis, April 21, 1985.

National Energy Conservation Program, Annex I: Detailed ENERCON Programme Activity Schedule for Year 1, May 1985.

National Energy Conservation Program, Annex II: Indicative Institutional Roles, May 1985.

National Energy Conservation Program, Annex III: Candidate Industries for Energy Audits and Project Implementation in the First Year (1985-1986), May 1985.

169 Industrial Energy Conservation Program Evaluation

Dominican Republic: Energy Conservation and Resource Development/Component 2: Industrial Energy Conservation Program, Final Evaluation Report, March 1985.

170 Regional Industrial Energy Efficiency Project Evaluation

Regional Industrial Energy Efficiency Project: First Evaluation (Final Report), (evaluation of ROCAP project), February 1985.

171 Energy Initiatives Project Evaluation

Djibouti Energy Initiatives: Mid-Term Evaluation/Conservation Component, Draft Report, January 1985.

173 Haiti - Industrial Energy Conservation Program

Haiti: Energy Efficiency in the Sugar and Manufacturing Industries, March 28, 1985.

177 Sri Lanka - Energy Use In Agriculture

Sri Lanka: Energy in Agriculture, Report on Study Team Visit April 1985, June 28, 1985.

178 Costa Rica - Fuel Efficiency in the Transportation Sector

Transportation Energy Conservation in Costa Rica: Report of In-Country Activities June 10-19, 1985, June 25, 1985.

PUBLICATIONS

Transportation Energy Conservation in Costa Rica: A Work Plan, June 25, 1985.

Costa Rica -- Transportation Fuel Conservation Project, Draft report, September 1985.

Implementation of Fuel Conservation Measures in Costa Rican Bus and Taxi Fleets, Final Report, June 11, 1986.

Road Transportation Energy Conservation: Needs and Options in Developing Countries, Draft Report, June 30, 1986.

179 Private Sector Involvement in Non-Utility Power Generation

Private-Sector Power Generation in Pakistan: Potential Impediments and Policy Issues, Final Report, June 1986.

Private-Sector Power Generation in Thailand: Potential, Impediments and Policy Issues, Draft Report, April 30, 1986.

181 Institutional Barriers to Private Sector Investment in Energy Conservation

Assessment of Barriers to Private Sector Investment in Energy Conservation and Cogeneration in Developing Countries, Draft work plan, November 8, 1985.

Energy Conservation in Developing Countries: Identification and Analysis of the Barriers to Private Investment, Draft Report, June 30, 1986.

182 General Field Technical Assistance

Kingdom of Thailand: The National Energy Saving Goals for Industry, 1986-1991, Draft Final Report, March 25, 1986.

Kingdom of Thailand: The National Energy Conservation Center: A Mobilization Plan, Final Report, March 24, 1986.

184 Technology Transfer Teams for Energy Conservation

Concept and Approach to Technology Transfer Teams for Energy Conservation -- Focus: Cogeneration, Draft, October 28, 1985.

Cogeneration Technology Transfer Team Meeting, Briefing Book, June 24, 1986.