AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington, D. C. 20523

PROJECT PAPER

Egypt: Energy Conservation & Efficiency
(263-140.3)

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number

DOCUMENT CODE: 3

2. COUNTRY/ENTITY: Arab Republic of Egypt

3. PROJECT NUMBER: 263-0140.3

4. BUREAU/OFFICE: HRDC/S&T Office — 263

5. PROJECT TITLE (maximum 40 characters): Energy Conservation & Efficiency

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 09 DD 30 YY 96

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)

A. Initial FY 88 B. Quarter 3 C. Final FY 92

8. COSTS ($000 OR EQUIVALENT $1 = 2.2)

A. FUNDING SOURCE	FIRST FY 88 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(12500)	(2500)	(15000)	(46900)	(2600)	(49500)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country	--	32000	32000	--	32000	32000
Other Donor(s)						
TOTALS	12700	34500	47000	46900	34600	81500

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ES	742	370			--	15000		49500	--
(2)									
(3)									
(4)									
TOTALS					--	15000		49500	--

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 878 | 874 | 840

11. SECONDARY PURPOSE C

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

A. Code: INTR | TNG

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To provide and accelerate the adoption of improved commercial technologies, processes and practices in order to save energy and increase energy efficiency.

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14. SCHEDULED EVALUATIONS

Interim MM 01 YY 92 | MM YY | Final MM 09 YY 96

15. SOURCE/ORIGIN OF GOODS AND SERVICES

[X] 000 [ ] 941 [X] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

USAID/Egypt Controller concurs with the proposed methods of implementatio and financing. Detailed assessments will be made when HC implementing un are established and fully staffed in accordance with the requirements and Covenants section of this document.

17. APPROVED BY

Signature: William A. Miller, Control

Title: Marshall D. Brown, Director, USAID

Date Signed: MM 06 DD 13 YY 92

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

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(1) ES	742	870			--	15000		49500	--
(2)									
(3)									
(4)									
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AID 1330-4 (8-79)

THIRD AMENDMENT

TO

PROJECT AUTHORIZATION

Name of Country: Arab Republic of Egypt

Name of Project: Science and Technology for Development

Number of Project: 263-0140

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended (the "Act"), the Science and Technology for Development Project (the "Project") was authorized on July 30, 1985 and was amended on July 7, 1987 and June 12, 1988. The Project Authorization is hereby further amended as follows:

a. Paragraph 2 is further amended by adding a new subparagraph (c) as follows:

"I hereby authorize the Energy Conservation and Efficiency (ECE) Component of the Project. The purpose of the ECE Component is to provide and accelerate the adoption of improved commercial technologies, processes and practices in order to save energy and increase energy efficiency. From the total estimated Phase II obligations for the Project, the ECE Component shall involve estimated obligations of Forty Nine Million, Five Hundred Thousand United States Dollars ($49,500,000)."

b. Paragraph 3b (Conditions Precedent to Disbursement) is further amended by adding new clauses (5) and (6) to read as follows:

"(5) Additional Disbursements for the ECE Component: Public Sector Activities

Prior to the disbursement of funds, or the issuance by A.I.D. of commitment documents under the Project, to finance public sector activities under the ECE Component other than interim contract services and local management services, the Cooperating Country shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D., with reference to such public sector activities:

i. Evidence of establishment of a Steering Committee and a Secretariat including, for the first year of activities under the ECE Component, formal designation of members of the Steering Committee and of the Executive Director of the Secretariat; and

ii. Evidence that the Secretariat has formulated and adopted appropriate arrangements for financing technology applications.

(6) Additional Disbursements for the ECE Component: Private Sector Activities

Prior to the disbursement of funds, or the issuance of commitment documents under the Project, to finance private sector activities under the ECE Component other than interim contract services and local management services, the Cooperating Country shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in the following sequence, in form and

substance satisfactory to A.I.D., with reference to such private sector activities:

i. Evidence that the Development Research and Technological Planning Center (DRTPC) at Cairo University has appointed a full-time Executive Director and necessary support and implementation staff; and

ii. Evidence that a circular or other appropriate documentation has been issued by the Cooperating Country setting forth in reasonable detail the terms and conditions applicable to private sector loans and grants to be made under the ECE Component."

c. Paragraph 3 is further amended by adding a new subparagraph "f" to read as follows:

"f. Additional Covenants for ECE Component

i. The reflows from public sector loans will be deposited into a Special Account, to be administered by the Steering Committee, and will be used exclusively for meeting ECE Component-related requirements as agreed between A.I.D. and the Cooperating Country;

ii. Reflows from the private sector loans will be deposited into a Special Account, administered by DRTPC, and will be used exclusively for meeting ECE Component-related requirements as agreed between A.I.D. and the Cooperating Country;

iii. The Steering Committee, Project Secretariat, and DRTPC will meet formally with A.I.D., at least semi-annually, to discuss progress and issues under the ECE Component;

iv. Egyptian public sector organizations involved in the ECE Component will provide the Project Secretariat with information, data, reports, and other documents resulting from this Project;

v. The Cooperating Country will provide, on a timely basis, all local logistic support as may be required to ensure effective use of ECE Component-financed goods and services.

vi. The Cooperating Country will provide to A.I.D. the details of its counterpart contribution to the ECE Component on a timely basis; and

vii. Neither A.I.D. funds, nor funds derived from the Special Account generated under the Commodity Import Program, nor L.E. generated under this Project, will be used to pay salary supplements under the ECE Component except pursuant to mutually agreeable criteria."

2. Except as hereinabove amended, the Project authorization, as previously amended, remains in full force and effect.

Marshall D. Brown
Mission Director
USAID/Egypt

6-13-88
Date

Doc #1000A
Final Version
Date:05/15/88

PROJECT PAPER

S&T FOR DEVELOPMENT (263-0140)

ENERGY CONSERVATION AND EFFICIENCY COMPONENT
(263-0140.3)

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PROJECT DATA SHEET

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I. PROJECT RECOMMENDATIONS AND SUMMARY

A. Recommendations:

The Project Committee recommends that an Economic Support Fund (ESF) grant of $49.5 million be authorized for the Energy Conservation and Efficiency component (The Project) of the Science and Technology for Development Project (263-0140). This eight year project should be incrementally funded as follows:

FY 88: $15.0 million
FY 90: $11.1 million
FY 92: $23.4 million

B. Host Country Contributions*:

The Government of Egypt (GOE) contributions, in-kind and cash are L.E 25.2 million ($11.45 million) and L.E. 12.5 million ($5.68 million) respectively totalling L.E. 37.7 million ($17.3 million). The private sector contributions will also be in-kind and cash and are estimated at L.E. 16.6 million ($7.54 million) and L.E. 16.2 million ($7.36 million) respectively totalling L.E. 32.8 million ($14.7 million). The total host country contribution (GOE and private sector) is estimated at L.E. 70.5 million ($32.03 million). Details are provided in Table I-1.

C. Summary Project Description:

1. Project Rationale:

Egypt faces a number of serious energy problems that are placing severe strains on the economy and are likely to constrain future economic development. Among these is an extremely inefficient use of energy in industry. A project to promote energy conservation and efficiency will help rectify this problem. In addition, by decreasing the energy content of goods and services, the Project will ease the transition to higher energy prices required under the IMF structural adjustment program. Finally, the Project directly supports the GOE's industrial development plan and supports USAID's long-term development strategy and goals.

2. Project Goal and Purpose:

The goal of this Project is to improve the productivity and competitiveness of the Egyptian economy by improving the energy efficiency of its industrial and commercial processes and practices.

---

* The Conversion rate of US dollars at $1=LE2.2 rate is only made for presentation purposes and does not imply "maintenance of value" if the exchange rate changes during the life of the project.

The Project's purposes are to promote and accelerate the adoption of improved commercial technologies, processes, and practices in order to save energy and increase energy efficiency, and improve Egyptian institutional capabilities, particularly in the private sector, at promoting and implementing energy-saving and productivity-enhancing investments.

3. Project Outputs:

The following major outputs are expected over the life of the Project:

- o Approximately 60 applications of energy-efficient technologies and practices in both the private and public sectors, saving an estimated 200,000 tons of oil equivalent per year by 1995 or $25 million per year at 1987 international oil prices.

- o Improved capabilities in at least three Egyptian organizations to promote, identify, engineer, install, operate and maintain such technologies. These capabilities will be developed in organizations such as the Development Research and Technological Planning Center, the Tabbin Institute for Metallurgical Studies, and the Federation of Egyptian industries. In addition, training will be provided (in Egypt and the U.S.) to approximately 1250 plant and other personnel, of which 300 will receive training directly related to technology applications. Finally, the capabilities of at least two Egyptian organizations will be upgraded to train personnel beyond the Project's life.

4. Project Organization and Management:

The Project is divided into two components: one private sector and one public sector, with management, technical assistance, project promotion and information dissemination support provided to both.

- o The private sector component (which includes Law 43 companies) will be managed and implemented by Cairo University's Development Research and Technological Planning Center (DRTPC). The firms will be reponsible for monitoring the performance of the technology applications.

- o The public sector component will be implemented through the Ministry of Industry. A Steering Committee will provide overall policy guidance and approve technology applications. A Project Secretariat, comprised of the Tabbin Institute for Metallurgical Studies (TIMS), will be responsible for project management and implementation.

- o Management and technical assistance will be provided to DRTPC, TIMS, the Federation of Egyptian Industries (responsible for project

promotion and information dissemination), and participating companies by a contractor, competitively selected by USAID.

5. Project Funding:

USAID will provide $49.5 million from a grant, of which approximately $37 million will be for purchasing and installing energy conserving and productivity-enhancing technologies. A combination of loans and grants will be provided to public and private companies to finance the foreign currency cost of the technologies. The balance of the USAID grant will be used to pay for technical assistance, investment promotion activities and project evaluation. Table I-1 summarizes project costs by activities and funding source.

The project will be incrementally funded in three obligations. Before the second and third obligations are made, USAID will review the performance and demands of the private and public sector components to determine the amount of obligation and the funding share between the two sectors.

6. Analyses: Summary Findings:

The design team conducted more than 150 interviews with Egyptian private and public organizations and international donor agencies. The team used the results of these interviews to evaluate the ability of Egyptian organizations in: implementing an effective energy conservation program; determining technical assistance and training needs; identifying specific organizations to participate in the Project, and designing the most efficient and effective organization and management framework.

These interviews revealed that the private sector's willingness to participate in the Project depended, to a large extent, on keeping the public sector out of the organization and management structure and decision-making process for private sector projects and on ensuring that the entire energy conservation investment process be as simple as possible. On the other hand, the production and investment activities of public industrial enterprises are planned and managed by various ministries and public sector authorities.

The Project Committee has reviewed and discussed the Energy Conservation and Efficiency Project in detail. The Project is considered economically, administratively, and technically feasible, socially sound and without negative environmental effect. The net present value of the Project, excluding replications, is estimated conservatively at $120 million (using a 10 percent discount rate). The cost estimates are reasonable and the Project meets all applicable statutory criteria.

7. Waivers:

USAID/DIR is requested to waive:

The procurement regulations in Handbook 11, chapter 3, for host country procurement in order to use procurement regulations in Handbook 15, chapter 3, related to the Commodity Import Program (CIP), since the Project's financing arrangements have been modeled after the CIP. This waiver will speed the procurement process, thus encouraging participation by private sector firms concerned about potentially long delays in introducing these new technologies.

Table I-1

Illustrative Budget Summary
(000)

	AID Contribution			GOE Contribution		Private Sector		Host
	FX $	LC $	Total $	In-kind LE	In-cash LE	In-kind LE	In-cash LE	Country Total
. Commodities	37000.00	-	37000.00	24200.00	8100.00	16200.00	16200.00	64700.00
I. Technical Serv.								
Technical Assist.	7088.73	-	7088.73	-	-	-	-	-
Training	1911.27	-	1911.27	400.00	-	400.00	-	800.00
UBTOTAL II	9000.00	-	9000.00	400.00	-	400.00	-	800.00
II. Local Mgt & Serv.								
Public Sector	-	1430.00	1430.00	530.00	3825.00	-	-	4355.00
Private Sector	-	950.00	950.00	30.00	-	-	-	30.00
Information Dissemination	-	220.00	220.00	40.00	575.00	-	-	615.00
UBTOTAL III		2600.00	2600.00	600.00	4400.00	-	-	5000.00
V. Evaluation/Audit	900.00	-	900.00	-	-	-	-	-
RAND TOTAL	46900.00	2600.00	49500.00	25200.00	12500.00	16600.00	16200.00	70500.00

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II. PROJECT RATIONALE

A. The Problem:

Despite substantial energy resources, Egypt faces a number of serious energy problems that are placing severe strains on the economy and are likely to constrain future economic development. Some of these problems are outside the Government of Egypt's (GOE) control, while others result from inadequate or ineffective energy policies and practices. These interrelated problems are:

- Subsidized energy prices are promoting inefficiency and contributing to massive budget deficits. Egypt's energy resource abundance has allowed the GOE to maintain extremely low energy prices through price controls and subsidies. Even with recent price increases, domestic energy prices average less than one-third of border prices. These price controls and subsidies have encouraged rapid growth in energy demand and wasteful use of energy, diverting potential petroleum exports to meet domestic demand. In addition, economically questionable investments have been made because energy subsidies have concealed the true economic costs of major industrial investments, such as aluminum and fertilizer. Finally, energy subsidies are costing the GOE approximately LE 6 billion per year, equal to about 12 percent of Gross Domestic Product (GDP) or more than 80 percent of the total budget deficit.

- Energy consumption is unusually high. Per capita energy consumption in Egypt is approximately 588 kg. of oil equivalent, which is 36 percent higher than the average for countries at similar income levels. In 1986, total commercial energy consumption was approximately 25.5 million metric tonnes of oil equivalent (TOE).

- High demand growth may result in future energy shortages. As a result of rising incomes and low energy prices, between 1975 and 1985 electric power demand grew 11.8 percent per year and oil and natural gas use grew by more than 10.0 percent per year. If the projections of the new Five-Year Plan (1987/88-1991/92) are met, industrial energy demand may increase by more than 10 percent per year. Overall, commercial energy demand will increase an estimated 7.5 percent per year through 2000. At this rate, demand will be approximately 49.0 million MT by 1995 and 70.3 million MT by 2000, which means that Egypt is likely to become a net energy importer within 10 years. There is already a shortage of electric power to meet demand, and over the last two years load shedding during peak periods, by as much as 600 MW, has occurred. Shortages in the next few years, primarily in the electric power sector, will result in poor system reliability, inability to meet peak demands, scheduled and unscheduled brownouts and blackouts, reduced productivity in both the manufacturing and service sectors, and unproductive investment in standby on-site diesel generation.

- Meeting future demand will be extremely expensive. Meeting the expected growth in energy demand will require tremendous capital investments. If the GOE plans to rely on domestic energy resources to meet demand, a minimum of $15 billion will be required over the next 10 years. Given Egypt's current economic situation, such investments will be difficult if not impossible to finance.

- Oil export revenues are declining. In the past, oil exports have accounted for more than 50 percent of Egypt's total export revenues. The fall in world oil prices sharply reduced oil export revenues, from $3.33 billion in 1981/82 to only $686 million in 1986. Although 1987 earnings may recover to $1.5 billion, this is still far below even 1985 earnings of $2.6 billion. In addition to lower oil prices, rapidly growing domestic consumption is diverting potential oil exports to the domestic market.

- Energy losses cost the economy more than one billion dollars per year. GOE energy policies have focused almost entirely on developing new energy supplies rather than improving the efficiency of existing supplies and better demand management. As a result, the efficiency of power generation and transmission, and energy end use have been extremely poor. As much as 2,500 MW of power generating capacity, or 30 percent of total installed capacity, is currently lost because of inefficiency in generation, transmission, distribution, and end use. A review of Egyptian industry's specific energy consumption levels showed these to be on average 60 percent higher than international standards (see Annex D) which indicates theoretical potential energy savings of 30 to 40 percent. These energy losses cost the Egyptian economy more than $1 billion per year through lost foreign exchange earnings from potential petroleum exports and reduced productivity.

These problems will become much more severe and difficult to remedy with time. A detailed discussion of Egypt's energy situation appears in Annex B.

B. Project Rationale:

Given the nature and severity of Egypt's current economic and energy problems, high and immediate priority should be given to programs to improve productivity and efficiency. Through the Energy Conservation and Efficiency Project, USAID will promote and accelerate the adoption of energy-efficient technologies and practices. This will reduce the energy content of goods and services, thus increasing productivity and competitiveness. The Project's rationale is presented below.

1. Contribution to the GOE's development goals:

This Project directly supports the GOE's development goals. By increasing industrial productivity and efficiency, the project will assist the GOE in achieving its industrial growth targets. The

1987/88-1991/92 Five-Year Plan expects industry to grow by 10 percent annually. Because of financial resource scarcity, increases in production are to be achieved primarily through increased productivity. By reducing energy costs, this Project will help the GOE to increase industrial productivity and competitiveness. In addition, the GOE's energy policy objectives include providing incentives for energy conservation and working with advanced countries to find ways to rationalize energy use (See Annex B). Finally, the new Five-Year Plan calls for the private sector's share of industrial investment to increase to 40 percent. This means the private sector's share of industrial energy consumption will increase as will the need for energy efficiency.

2. Need to conserve energy through technology applications and improved management and technical capabilities:

   This Project will promote cost-effective and immediate improvements in industrial productivity by introducing technologies that directly and indirectly increase energy efficiency. The Project focuses on technology applications because international experience and, to a lesser extent Egyptian experience, have shown that substantial energy savings can be achieved by investing in specialized technologies. It is estimated that savings of 10 to 30 percent of industrial oil, gas and electricity use are achievable (depending upon plant type, size, and age). This means the Project could save Egypt in excess of 200,000 TOE per year by 1995, estimated conservatively at $25 million per year at 1987 international oil prices. In general, two-thirds of the potential energy savings must be captured through technology investment, and the rest through low cost measures (often called "housekeeping" measures).

   However, international experience has also shown that introducing technologies is not enough. Improved management and technical capabilities are also required. Many large energy users in Egypt are not aware of their energy-saving potential and lack the skills to identify and implement energy conservation measures. Therefore, the Project will also provide management and technical support, training, and promotional programs to increase awareness of energy conservation benefits, and develop lasting capabilities within Egypt to identify and implement both low cost measures and technology applications.

3. Need to promote energy conservation and efficiency to prepare Egyptian economy for higher energy prices required under structural adjustment program:

   Energy prices in Egypt are heavily subsidized. However, as part of the structural adjustment program negotiated with the International Monetary Fund, the GOE has agreed to increase local energy prices to economic levels by 1992. Given the current differential between

financial and economic prices and the inefficiency of energy use, such price increases will impose tremendous hardships on the Egyptian economy. An energy conservation and efficiency project is needed now so that energy users will be prepared to adjust to higher energy prices. By demonstrating now the technical and economic viability of energy conservation and efficiency technologies, and at the same time developing the technical and managerial capabilities to implement them, this Project will accelerate their widespread adoption when energy prices are no longer subsidized, thereby easing the transition to higher energy prices. In addition, by increasing the efficiency of energy use and decreasing the growth in energy demand, the Project will release domestically-produced oil for export, resulting in increased foreign exchange earnings, or help the GOE to extend the life of its oil reserves.

4. Support for USAID's strategy and goals:

This Project plays a key role in the Mission's energy strategy. The current Country Development Strategy Statement (CDSS) for Energy calls for a better balance in USAID's program between increasing energy supply and reducing energy demand. The CDSS proposes a "least cost" energy strategy for Egypt that emphasizes power plant rehabilitation, energy conservation, improved manpower, and improved energy planning. This Project is the energy conservation component of the Mission's strategy and the only project that focuses specifically on energy demand technology applications.

The Project also directly supports USAID's "four pillars" of development by (1) improving the energy efficiency, productivity and competitiveness of private firms; (2) encouraging the transfer of energy-efficient technologies; (3) developing institutional capabilities for identifying, designing, installing, operating, and evaluating energy-efficient systems, and (4) promoting a policy dialogue on energy pricing by easing the transition to higher energy prices.

C. Issues and Comments:

The major issues raised during Project design are briefly summarized below. A more detailed description appears in Annex C.

1. Energy Supply Side vs. Energy Demand Approach:

Until now Egypt has tackled its ever increasing energy consumption by focusing on energy supply. Attention is now shifting to energy demand as the GOE and donors become increasingly aware of the high cost and long leadtime to develop supply options and realize the enormous potential for energy conservation. USAID, in particular, has changed the focus of its energy strategy to include the demand side.

In the industrial sector alone about 2 million Tons of Oil Equivalent (TOE) could be saved annually to meet other energy needs. These savings could be achieved much faster than any other supply alternative and at a fraction of the cost (generally 30 to 50 percent).

2. Technology Application vs. Research and Development:

The average Egyptian industrial plant consumes 30 to 40 percent more than similar plants operating at international standards. The ways to capture most of these savings are well known. They consist of technologies and practices which have been well proven in other countries.

The need at this time is not to conduct research but to bring existing industrial processes up to the latest international standards.

3. Energy Conservation in Industry vs. Other Sectors:

Industry is the largest sectoral energy consumer, accounting for approximately 45 percent of total commercial energy consumption. Industry consumes eleven million TOE out of a national total of 25 million TOE. Industrial plant visits and discussions with Egyptian and international donor agencies indicate that there is a great potential for energy efficiency improvements in the industry sector especially in the metallurgical, chemical and cement subsectors.

There are currently no comprehensive industrial energy conservation programs in Egypt. This Project fills an important gap in Egypt's energy and industrial development efforts.

4. Private vs. Public Sector Focus:

The objective of the Project is to achieve the greatest possible current and future energy savings and at the same time to remain consistent with USAID's private sector strategy. The public sector currently accounts for approximately 80 percent of industrial energy consumption and has the largest immediate energy savings potential. On the other hand, although the private sector currently consumes only 20 percent of industrial energy, its share is projected to increase to between 30 and 40 percent by 1995.

In light of these trends, the Project will address both the public and private industrial sectors. To maximize private sector participation, the Project will be open to all private sector companies (e.g., industry, hotels). The initial funding split between the public and private sectors will be 50/50 (see Exhibit II-1). Before each new funding obligation, USAID will review the performance and needs of the public and private sector components to determine if adjustments should be made in the funding shares.

Exhibit II-1

Options for Initial Public/Private Funding Split

OPTIONS	PROS	CONS
1. 80% Public/20% Private	- Public sector has largest energy saving potential - Funds will be quickly disbursed because several large projects have been identified - Public sector is very open to allowing outsiders into plants, including private sector.	- Contradicts USAID emphasis on private sector - Public sector has less incentive to ensure success of technology application
2. 50% Public/50% Private	- Appears neutral	- Looks artificial
3. 20% Public/80% Private	- Consistent with USAID private sector strategy - Will improve substantially the competitiveness of private sector - Rate of success of individual applications likely to be higher	- Money will not be disbursed - Will not tap largest energy savings potential - Higher management burden because many small projects

Recommendations:

1. Initial public/private split of 50% (for a period of 18 months)
2. Review performance of public and private components before second funding obligation
3. Adjust project split in second funding obligation
4. Review performance of public and private components before third funding obligation
5. Adjust project split in third funding obligation

5. Need for Financial Incentives to Participate in Project:

The need for financial incentives, especially for demonstration projects, is confirmed by experience of many other countries, including the United States, France, the United Kingdom, Germany, and Japan, where grants of 50 to 100 percent of energy conservation investments have been common. In this Project, financial incentives are needed to at least compensate the user for the additional costs incurred for participating in the Project. These additional costs include: proposal preparation (including conducting audits); purchasing metering equipment; monitoring the performance of technology applications; purchasing equipment from the U.S. versus other countries (higher f.o.b. cost of U.S. equipment, higher shipping costs from the U.S. versus Europe); and non-technical risks (such as changes in energy prices). Financial incentives may also be needed to ensure that the Project starts implementing technology applications immediately.

Financial incentives will be in the form of grants, ranging from 15 to 40 percent of the foreign exchange cost of small technology applications (less than $100,000 in foreign exchange) and 25 to 50 percent of the foreign exchange cost of medium and large technology applications. These percentages correspond to 10-30 percent of total project costs, i.e. foreign plus local costs. In addition, the company will repay any foreign exchange loans with local currency at an exchange that is fixed at the time the loan is approved, thus eliminating any foreign exchange risk to the user. The need for incentives, especially to encourage private sector participation, will be reviewed regularly by USAID and adjusted as necessary. See Section VI, IMPLEMENTATION PLAN, for more details on the Project's financing arrangements.

III. PROJECT DESCRIPTION

A. Goal and Purpose:

The goal of this Project is to improve the productivity and competitiveness of the Egyptian economy by improving the energy efficiency of its industrial processes and practices.

The Project's purposes are promoting and accelerating the adoption of improved commercial technologies, processes, and practices in order to save energy and increase energy efficiency; and improving Egyptian institutional capabilities at promoting and implementing energy-saving and productivity-enhancing investments.

B. Project Strategy:

This Project is the outcome of extensive preparation and analysis. A design team conducted over 150 interviews with more than 85 Egyptian private and public organizations and international donor agencies, public and private industrial enterprises (including 44 plant visits), energy equipment and services suppliers, banks, trade associations, government institutions, research institutes and universities, USAID personnel, the United Nations Development Program, and the World Bank. In addition, many studies, reports, and articles were reviewed and consulted.

Seven important strategic considerations guided the Project's design:

- Focusing on areas which have potential for large energy savings and efficiency improvement. Since the Project's major objective is improving productivity by increasing energy efficiency, the technologies selected should result in large energy savings. This refers both to the relative energy savings in a specific plant for a particular operation as well as the overall effect on the country. Therefore, the Project's initial targets are the cement, chemicals and metallurgical sectors, which together account for 53 percent of industrial energy consumption and the private commercial sector.

- Considering only applications and companies which are economically viable. To foster economic efficiency the Project concentrates on technologies which have a positive economic value to the country, i.e. those with an economic return of at least 15 percent. In addition, public companies that are not economically viable, such as Nag Hammady, will not be eligible to participate in the Project.

- Focusing on technologies that can be widely replicated. The Project is a technology demonstration and investment promotion effort. Therefore, one of the criteria for selecting target technologies and sectors is the extent to which these applications can be replicated in Egypt. The Project will consider only those applications that can be replicated in private and public sector facilities.

- Promoting only proven technologies. To maximize near-term energy savings, the Project concentrates on technologies that have been proven in other countries, particularly the United States, but have not yet been used widely in Egypt.

- Recognizing the differences between the private and public sectors. The Project's implementation strategy must recognize the divergent structures, decision-making processes, and concerns of the private and public sectors. To this end, the Project has been divided into two separate components: one for the private sector and one for the public sector.

- Maximizing incentives for private sector participation. The Project has been designed to be attractive to the private sector. First, because energy prices paid by private companies have been increasing, they have a strong incentive to reduce energy costs. Second, to maximize private sector participation, the Project will be open to all industrial and commercial enterprises in the private sector. Third, the private sector technology application process has been streamlined to eliminate any delays and ensure rapid implementation. No government entities will be involved in the managing and implementing of the private sector component. Fourth, grants will be provided to help finance part of the foreign exchange portion of technology applications and any foreign exchange loans will be repaid in pounds at a fixed exchange rate. Fifth, technical assistance and training will be provided to further increase the energy efficiency, and hence the productivity and competitiveness, of private companies.

- Focusing on firms whose total use of energy could be reduced while sustaining, or even increasing production, and/or on firms whose use of energy could remain constant while their production expanded. Firms using a technology which increases both in output and energy use cannot be considered.

C. <u>End of Project Status</u>:

The Project Assistance Completion Date (PACD) is September 30, 1996, assuming a start-up date of May 1, 1988. At the end of the Project, its outputs will include both technology applications and improved institutional capacity to deliver these technologies to other Egyptian energy users.

- Approximately 60 demonstration applications of energy conserving technologies and practices in private and public industrial and commercial facilities.

- Awareness of the technical and cost performance of these applications to promote their replicability in other facilities.

- o Improved capacity in at least 3 Egyptian organizations and local architecture/engineering firms to promote, identify, engineer, install, operate, and maintain energy conserving technologies. The Development Research and Technological Planning Center (DRTPC) and the Tabbin Institute for Metallurgical Studies (TIMS) will have an improved capability to train personnel in the technical and managerial skills needed to identify and implement these technologies and practices. In addition, the Federation of Egyptian Industries' (FEI) ability to disseminate energy conservation information to its members and to make recommendations to the GOE for policy reforms to improve industrial productivity will be improved. At least 1250 personnel will receive energy conservation training, of which 300 will be trained in all aspects of energy technology applications including project identification and evaluation, design, procurement, installation, operation and monitoring.

D. Project Activities:

The Project will carry out two types of activities: (1) energy technology applications, and (2) promoting investments in these technologies.

1. Energy Technology Applications:

These efforts will be directed at selecting, designing, installing, operating, and monitoring energy efficient technologies that are economically, financially and technically viable, and replicable in other facilities. This involves the following three major subactivities:

a. Identifying Technologies and Sites: An important activity will be identifying and selecting those technologies and practices that will result in significant benefits to Egypt, and will have the highest pay-off for the resources spent. Ten technologies emerged as targets for the initial phase of the Project (see Annex D for details on these technologies and the rationale for their selection). They include:

- Micro-computer and micro-processor based process controls
- Electronic energy management systems
- Automatic combustion controls
- Waste heat recovery systems
- Cogeneration systems (topping and bottoming, including organic Rankine cycles)
- Advanced insulation materials for large-scale applications
- High efficiency electric motors
- Solid fuel-fired combustors (such as fluidized bed boilers)
- Power factor improvement systems (including automatic power factor correction systems and large synchronous motors), and
- High efficiency lighting systems for large-scale industrial applications.

Additional technologies may be added during the Project if they meet the crtieria of economic, financial, and technical viability and replicability. Additional technologies will be recommended by the management and technical assistance (M/TA) contractor and approved by USAID.

To ensure that activity sites have the greatest potential for serving project purposes, they should have the following characteristics:

- The owner/operators are willing to allow others to visit the site and to share information on actual costs and performance
- The owner/operators are committed to ensuring the technologies work properly
- The site is similar to others that may use this technology in important characteristics such as type of process equipment (i.e., replications can occur), and
- The site is convenient to visit

During the early Project years, technical assistance will have to be provided to the firms (at no cost to them) to identify and evaluate opportunities for technology applications. This assistance will be provided by DRTPC (private firms) and TIMS (public firms), with support from a long-term management and technical assistance contractor (M/TA).

b. Applying Technologies: Most of the Project activities (and thus expenditures) will be associated with technology application. These activities include evaluating (including energy auditing), designing, adapting, financing, installing, operating, and maintaining a specific application at a given site. Technical assistance will be provided by the Project throughout this process (see Project Elements: Inputs for funding sources). The technology application process for both the private and public sectors is summarized below. Four institutions play key roles in this process: the Development Research and Technological Planning Center (DRTPC) in the private sector, the Tabbin Institute for Metallurgical Studies (TIMS) in the public sector, and the Federation of Egyptian Industries (FEI) and commercial banks in both sectors.

Technology Application Process - Private Sector Component: As the result of a promotional campaign conducted by DRTPC and FEI, a private sector firm submits a technology application request to a participating private commercial bank. The bank forwards the request to DRTPC. DRTPC, with M/TA contractor assistance as needed, reviews the request and assists the firm in preparing a detailed proposal. This proposal includes a description of the technology application, preliminary cost estimates, expected savings, and general business information on the company. DRTPC, again with M/TA contractor assistance as needed, evaluates the technical and economic feasibility

of the proposal, determines its replicability potential, ensures that the proposal is not repetitive of other applications that have already been implemented, and determines the size of the grant portion that will be offered to the company in accordance with guidelines established by USAID (see Section VI, Implementation Plan). Depending on the size of the investment and the complexity of the technology, DRTPC might ask the company to prepare a more detailed feasibility analysis.

For technology applications of more than $1 million, or where the recommended grant is more than 40 percent of the total funds to be provided by USAID, DRTPC must receive USAID approval of the technology application. If the proposal is approved by DRTPC (and USAID when required), it is returned to the bank, along with instructions for the technology application's grant element. The bank evaluates the financial viability of the proposed technology application and conducts any other necessary analyses of the company. If the proposal is financially acceptable to the bank, it prepares a financing package which includes loan agreements (grant and loan shares of foreign currency component, equity and debt shares of local currency component), collateral, and other documentary requirements. The bank finances the local currency component of the loan through its existing sources if the company does not have sufficient equity.

After financing has been arranged, the bank opens an L/C (or several L/Cs if more than one U.S. supplier is involved) for the commodities and equipment with its corresponding bank in the United States. The bank acts as guarantor on the foreign exchange loans and is responsible for administering the loan to ensure compliance with the loan agreement.

The company executes contracts with all suppliers on the basis of good commercial procurement practices. Equipment and commodities arrive and are installed by the company, with technical assistance and training from DRTPC and the M/TA contractor if necessary. The technology application begins.

Technology Application Process - Public Sector Component: As the result of a promotional campaign conducted by FEI, a public industrial enterprise, either alone or with assistance from TIMS, identifies a potential technology application and prepares a detailed proposal. TIMS evaluates the technical and economic feasibility of the proposal, determines its replicability potential, and ensures that it is not repetitive of other applications that have already been implemented. All of TIMS' tasks are carried out with assistance from the M/TA contractor. Depending on the size of the investment and the complexity of the technology, TIMS might ask the company to prepare a more detailed feasbility analysis. If TIMS and the M/TA contractor accept the proposal, it is submitted to the the public sector component's Steering Committee for approval, along with a recommended

grant element determined in accordance with guidelines establisehd by USAID. For technology applications of more than $1 million or where the recommended grant is more than 40 percent of the total funds to be provided by USAID for the technology application, the Steering Committee must receive final approval from USAID.

If the proposal is approved by the Steering Committee (and USAID when required), the proposal is submitted to a public bank (National Investment Bank or another public bank). The bank evaluates the financial viability of the proposed technology application and conducts any other necessary analyses of the company. If the proposal is financially acceptable to the bank, its prepares the financing package. Local currency is provided from the company's own budget or is arranged by the bank. After financing has been arranged, the bank opens the L/C(s) with its corresponding bank in the United States. The bank is also responsible for guaranteeing and administering the loan.

The company executes contracts with all suppliers on the basis of procurement practices agreed upon by USAID and the GOE. Equipment and commodities arrive and are adapted and installed by the company, with technical assistance and training from TIMS and the M/TA contractor if necessary. The technology application begins.

c. Monitoring Technology Performance: An important tool in technology promotion is reliable information on each technology application. To this end, the firms participating in the program will monitor (with DRTPC, TIMS, and M/TA contractor assistance) the technical and economic performance of each application. This information will be used by DRTPC and TIMS to prepare detailed case studies of each application which will then be disseminated widely by FEI. Additional costs to the firm (such as instrumentation costs) will be covered by the grant.

2. Technology Investment Promotion:

The balance of the Project's efforts will be aimed at promoting investments (i.e., replication) by other enterprises in the technologies that have been successfully applied. This includes the following subactivities:

a. Developing Institutional Capabilities: A key Project purpose is developing capabilities in Egyptian institutions to identify, evaluate, finance, procure, install, operate, monitor, and maintain advanced energy conservation technologies so that energy conservation activities will continue after the Project ends. To achieve this, the implementing agencies (DRTPC, TIMS and FEI) will receive training in these areas, as needed. The same training will be provided to others participating in the project, for example private and public companies and commercial banks (see Section VI and Annex I). Particular emphasis will be placed on helping DRTPC and TIMS to become the

V. SUMMARY OF FEASIBILITY ANALYSES

A. Technical Analysis:

The technical analysis identified three initial industrial target sectors and ten technologies for the Project. The target sectors are: cement, chemicals, and metallurgy. These three sectors account for approximately two-thirds of total Egyptian industrial energy consumption. They are also major targets for private sector investments in the new Five-Year Plan (1987/88-1991/92).

The technologies were selected using five criteria: energy savings, economic merit, replicability, proven technology not used in Egypt, and can be provided by U.S. suppliers. The selection was a result of 44 plant visits, reviews of existing studies, and interviews with energy experts in Egypt. The technology list in Exhibit V-1 is not all-inclusive and other technologies meeting selection criteria may be added as the Project progresses.

Because the technology applications will generally be new to Egypt, consideration must be given to ensure proper technology operation for several years. To meet this requirement, pre-defined maintenance programs are included into the technologies' first costs.

Based on the findings of the technical analysis, the initial 10 technologies were found to be feasible in the selected sectors, primarily because the processes have proven themselves in other countries. The detailed technical analysis appears in Annex D.

B. Cost-Effectiveness Analysis:

Because the final design of a number of technology applications will be decided as the Project is implemented, costs and benefits cannot be determined precisely at present. However, if the technology applications are assumed to fall mostly within the ten selected technologies, general conclusions can be drawn about overall Project cost-effectiveness.

Two types of analyses are undertaken to evaluate the attractiveness of each technology application; economic and financial. The economic analysis evaluates an investment from the point of view of the country as a whole, while the financial analysis evaluates an investment from the point of view of the individual investor.

The costs and benefits of the ten selected technologies were evaluated on the basis of their simple payback (i.e., the total capital investment required divided by the net benefits). Simple payback was chosen because: it is the most common economic evaluation criterion used by Egyptian managers to evaluate investments; it is simple to compute; and it gives as good an indication of relative value as more sophisticated approaches.

initial energy conservation and technical services organizations for the private and public sectors, respectively. In addition, to assist in identifying potential energy conservation opportunities, a comprehensive data base of industrial plant characteristics such as products, processes, size, and energy use will be developed by DRTPC.

b. Increasing Awareness of Energy Efficient Technologies: FEI, DRTPC, and TIMS (with assistance from the M/TA contractor) will increase technology awareness by disseminating reliable cost and energy saving information through workshops, seminars and trade meetings, publications in professional and trade journals, and special studies. In addition, visits will be sponsored to plants using technologies of interest to the Project. These efforts will be targeted to potential users, engineering firms, equipment vendors, and policy makers.

c. Reducing Policy and Regulatory Barriers to Investment: As part of their assessments of individual technology applications, DRTPC, TIMS, and the M/TA contractor will analyze specific GOE policies and regulations, such as energy pricing, import duties or taxes, that affect project implementation and technology adoption. Where these constrain introducing cost-effective technologies, they will suggest modifications to address these barriers.

E. Project Elements:

1. Inputs:

USAID, the GOE, and the Egyptian private sector will provide both funds and in-kind support to undertake these activities (see Annex K for details).

a. USAID: USAID support will consist of a grant of $49.5 million to the GOE which will be used to provide the following inputs:

- Energy conservation and productivity-enhancing equipment and monitoring instrumentation for a total of $37 million.

- Management and Technical support services for a total of $7.09 million. Specialized expertise will be provided by the Project in the areas of engineering, finance, economic analysis, and policy analysis. Assistance will be provided by US and Egyptian experts hired directly by the Project.

- Training for a total of $1.91 million. This includes both in-country and US based training of approximately 1250 participants.

- Management support services provided by the Project Secretariat, the University of Cairo, and the Federation of Egyptian Industries for $2.6 million during the first five years of project implementation.

- o Project evaluation and audit estimated at $0.90 million.

b. Host Country: Host country contributions to the Project will come from the GOE and the private sector.

- o The GOE contribution will be cash and in-kind and is estimated at L.E. 12.5 million ($5.68 million) and L.E. 25.2 million ($11.45 million), respectively. The GOE contribution will cover the following:

  - Local currency loans to participating public sector companies for equipment and related services. Public sector companies will provide demonstration sites.
  - Steering Committee and Project Secretariat operations, and information dissemination activities of FEI for the last three years of project implementation.
  - Salaries of participants in training programs, seminars, and workshops.

- o Private Sector: The Egyptian private sector will contribute sites where energy conserving technologies can be installed and monitored. These sites will be open to visits for other firms interested in the technology. In addition, the private sector will make major contributions, both cash and in-kind, to the Project. These contributions are estimated at L.E. 16.2 million ($7.36 million) and L.E. 16.6 million ($7.54 million), and cover the following:

  - Installing equipment and related services for the technology demonstrations.
  - Salaries of participants in information dissemination and other promotion activities in training programs, and in seminars and workshops.

2. Project Organization:

The Project is divided into two components, one for the private sector and one for the public sector, with management and technical assistance (M/TA contractor) and information dissemination services (Federation of Egyptian Industries) provided to both.

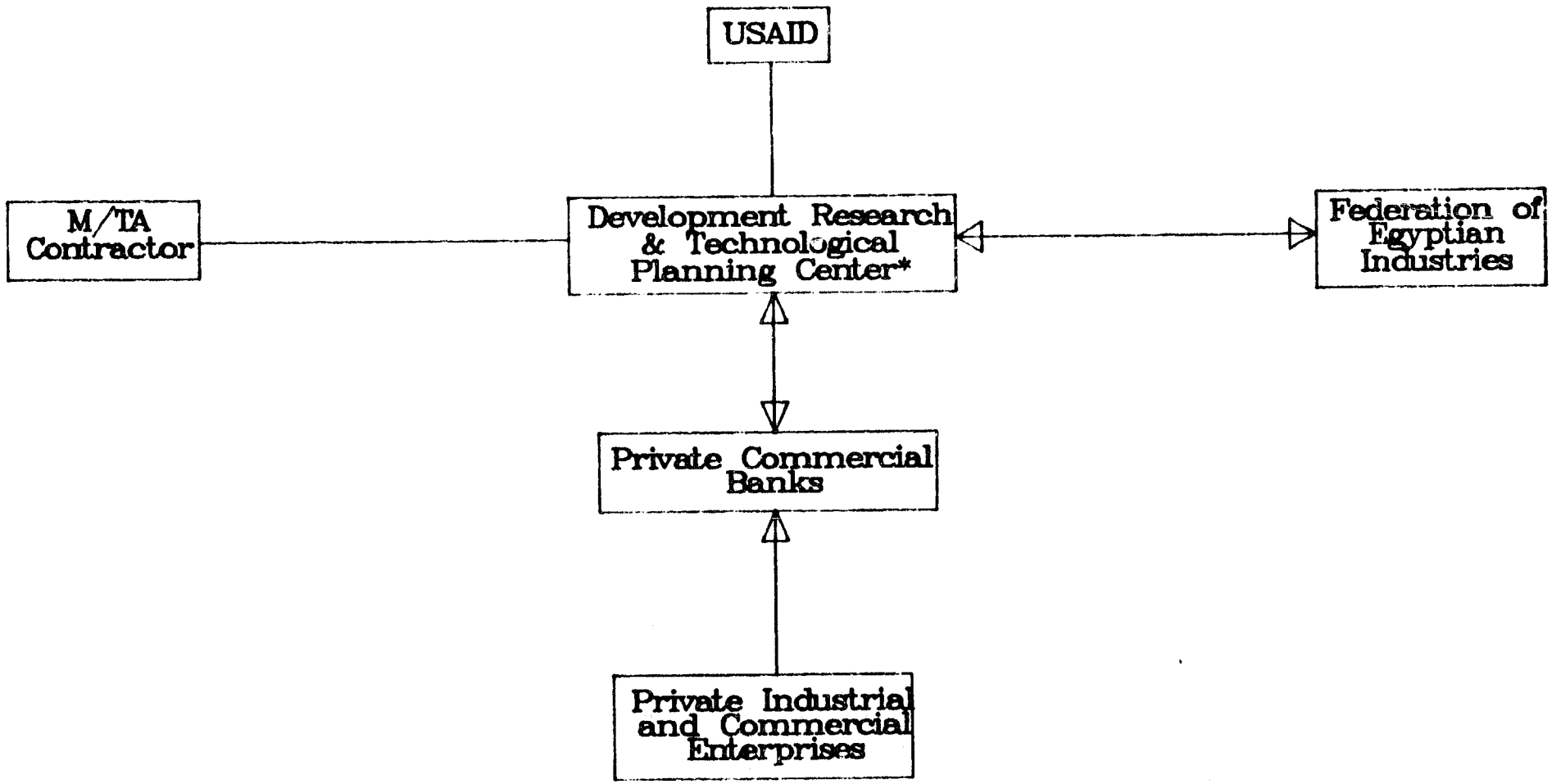
a. Private Sector Component: The organizational structure of the private sector component is presented in Figure III-1. Cairo University's Development Research and Technological Planning Center (DRTPC) will implement the private sector component and is the Egyptian counterpart agency. DRTPC will have both project management and technical services responsibilities. Private commercial banks will arrange and administer the financing for private sector technology applications. FEI will promote the Project and disseminate information on its

results, with assistance from DRTPC. Support will be provided by the M/TA contractor as needed. No public sector entity will be involved in managing or implementing technology applications in the private sector.

b. Public Sector Component: The organizational structure of the public sector component is presented in Figure III-2. This component will be implemented by the Ministry of Industry, as represented by the Tabbin Institute for Metallurgical Studies (TIMS). TIMS is the Egyptian counterpart agency for the public sector component. The organizational structure consists of a Steering Committee, which will provide policy guidance and approve technology applications, and a Project Secretariat (comprised of TIMS staff), which will have both project management and technical services responsibilities. TIMS will be supported in all of its activities by the M/TA contractor. Public sector banks will arrange and administer the financing for public sector technology applications. FEI will promote the public sector component, with assistance from the M/TA contractor as necessary.

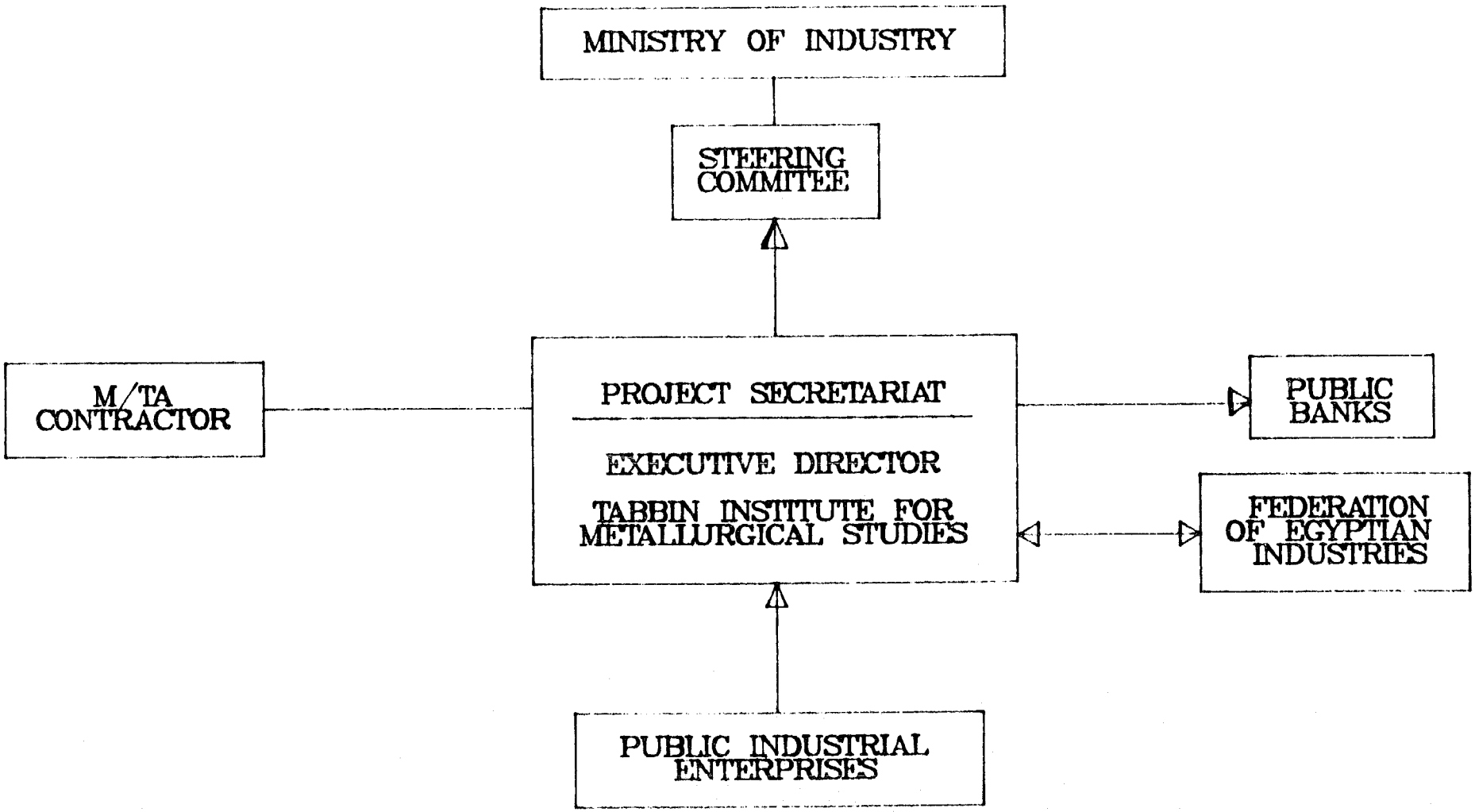
The responsibilities of all participating organizations are summarized in Section VI and presented in detail in Annex H.

FIGURE III–1
PROJECT ORGANIZATION: PRIVATE SECTOR COMPONENT



* Part of Cairo University

FIGURE III–2
PROJECT ORGANIZATION: PUBLIC SECTOR COMPONENT



IV. RELATIONSHIP WITH OTHER PROGRAMS

This Project will be closely coordinated with and complement related programs sponsored by USAID, the GOE, and other donors.

A. USAID:

As noted in Section II-B-3, this Project is a key component of USAID's CDSS for energy and supports the Agency's "four pillars" of development. In addition, the Project will relate to other USAID industrial, energy planning, research, and private sector programs. The Project will use the results of industrial projects and surveys conducted under the Industrial Technology Applications Program's (ITAP), audits and energy conservation studies prepared by the Organization for Energy Planning (OEP) and studies on energy use conducted under the Cairo University/MIT (CU/MIT) project to identify potential technology applications and sites and training and technical assistance needs. In addition, CU's Development Research and Technological Planning Center (DRTPC) will implement the Project's private sector component. To the extent possible, this Project will also rely upon the Private Investment Encouragement Fund (PIEF), Commodity Import Program (CIP) and the Small Scale Enterprise Credit Guarantee Program to fund replications of technology applications that have been successfully demonstrated by the Project. The International Executive Services Corps (IESC) and the U.S. Investment Promotion Office (USIPO) will complement this Project's efforts by publicizing its activities, providing contacts with private sector companies, and helping develop business ventures to provide energy conservation technologies and related services to Egyptian industrial enterprises.

B. Government of Egypt:

This Project directly supports the GOE's industrial development strategy in the Second Five-Year Plan (1987/88 - 1991/92). By applying new technologies and reducing energy costs, this Project will increase industrial productivity and competitiveness and assist the GOE in achieving its industrial and economic development goals.

C. Other Donors:

The United Nations Development Program (UNDP) and MOI are currently funding a small Energy Conservation in Industry Project (ECIP), which is being implemented by the Tabbin Institute for Metallurgical Studies. The project's limited funding (approximately LE 1,665,000 from MOI and $800,000 from UNDP) precludes the installation of any major energy-conserving equipment and limits the number of industries that can participate. This Project will complement the UNDP-MOI project by using the UNDP's findings to help identify technology applications and building on the management and technical skills already developed at TIMs.

Exhibit V-1
Technology Applications: Priorities

Industry	Technology									
	Process Controls	Energy Management Systems	Combus-tion Controls	Waste Heat Recovery	Cogen-eration	High Eff. Electric Motors	Power Factor Improv-ement	Insul-ation	Solid Fuel Fired Boilers	High Ef-ficiency Relamping
Cement	**	*	**	**	**	**	**	*		
Chemicals/ Fertilizers	**	**	**	*	**	**	**	*	**	*
Metals	**	*	**	**	*	**	**	**		
Textiles	*	**	**	*	**	*	*	*	*	**
Food	*	**	*	*	**	*	*		**	*
Woodworking				*	*	*	*		*	

Key: Attractiveness of the technology application

** Very High
* High

Technologies with the shortest payback periods are most attractive. Key assumptions were developed based on existing prices in Egypt, and the financial and economic parameters used by USAID and other donor agencies (see Annex E).

The results of the economic analysis indicate that all selected technologies or applications have economic paybacks of 0.1 to 6 years with an average of less than 2 years. The payback on the foreign exchange component of each project is even shorter. Therefore, all of these technologies are economically justified as demonstration targets.

Depending on the plant ownership (i.e., what price is paid for fuel and electricity), the financial paybacks show large variations. For example, in public sector plants, the application of cogeneration and waste heat recovery technologies have paybacks ranging from 9 to 67 years, whereas Law 43 companies have financial paybacks which are closer to the economic paybacks.

The total investment on commodities for the Project's technology applications is $37 million in foreign exchange (and LE 16.8 million in local currency provided by participating firms). Corresponding annual economic benefits are estimated at $24 million. Using a 10 percent discount rate, the net present value of the Project is $120 million and its economic benefit/cost ratio is 3.6 years; making the Project extremely attractive compared to other supply options in the energy sector (i.e., supply-oriented projects).

Under analysis, all 10 technologies were found to be economically feasible. Their average payback of two years corresponds to an economic rate of return approaching to 50 percent, which is significantly higher than the 15 percent required for a project to be considered economically viable.

The detailed cost-effectiveness analysis appears in Annex E.

C. Social Soundness Analysis:

The purpose of this Project is to promote and accelerate the adoption of improved technologies, processes, and practices in order to save energy and increase productivity. By demonstrating now the technical and economic viability of these technologies, the Project will accelerate their widespread adoption when energy prices are no longer subsidized. Furthermore, by decreasing the energy content of goods and services, this Project will ease the transition to higher energy prices.

The most direct beneficiaries of this Project will be the companies in which technologies are installed. The Project will help them reduce energy costs, improve their productivity, international competitiveness, profitability, and strengthen their technical and managerial skills. The Project's benefits extend beyond the direct beneficiaries to the rest of the industrial and commercial sectors, other energy-consuming sectors, the banking sector, and ultimately the economic welfare of all Egyptians.

The Project is socioculturally feasible to the extent that it saves energy in the short-term and reduces the hardships of energy price increases in the long-term. The full social soundness analysis appears in Annex F.

D. Environmental Analysis:

Installing and operating energy conservation equipment will have no currently identifiable adverse effects on the Egyptian environment. The equipment to be demonstrated will reduce the amount of energy needed to produce a given amount of product. This increased efficiency will mean more complete fuel combustion or electric power use, resulting in a reduction in fossil fuel use and lower air, water, particulate, solids, and sludge generation.

The proposed project is entitled to a categorical exclusion under the terms of 22 CFR Part 216 AID Environmental Procedures, Section 216.2 (c)(2)(ii) as the proposed activities are essentially a "field evaluation...confined to small areas and carefully monitored"; thus, neither an Environmental Assessment nor an Environmental Impact Statement are proposed.

E. Administrative Analysis:

The design team conducted more than 150 interviews with Egyptian private and public organizations and international donor agencies. The team used the results of these interviews to evaluate the ability of Egyptian organizations in: implementing an effective energy conservation program; determining technical assistance and training needs; identifying specific organizations to participate in the Project, and designing the most efficient and effective organization and management framework.

These interviews revealed that the private sector's willingness to participate in the Project depended, to a large extent, on keeping the public sector out of the organization and management structure and decision-making process for private sector projects and on ensuring that the entire energy conservation investment process be as simple as possible. On the other hand, the production and investment activities of public industrial enterprises are planned and managed by various ministries and public sector authorities.

In light of the divergent structures, decision-making processes, and concerns of the private and public sectors, the design team concluded that the simplest and most effective way to organize and manage the Project would be to divide it into two separate components -- one private sector and one public sector -- with general management and technical assistance (M/TA) provided to both.

The private sector component will be implemented by Cairo University's Development Research and Technological Planning Center (DRTPC), with financing of technology applications arranged by private commercial banks, and promotion services provided by the Federation of Egyptian Industries (FEI). The public sector component will be implemented by the Ministry of Industry, represented by the Tabbin Institute for Metallurgical Studies (TIMS), with financing of

technology applications arranged by public banks, and promotion services provided by FEI. The Project will be publicized and its results disseminated by the FEI, and M/TA will be provided by a competitively-selected contractor.

The Project as designed is administratively feasible. An assessment of the Project's participating organizations, needs and capabilities appears in Annex G, and their roles and responsibilities are described fully in Annex H.

F. Financial Analysis:

USAID will provide a grant of $49.5 million to the Egyptian government for purchasing equipment, maintenance, administrative support, and technical assistance. Purchases of equipment and maintenance will comprise $37 million of this grant -- of which the first obligation ($15 million) will be split equally between the private and public sectors. These funds will be used to pay the foreign exchange requirements of the demonstrated technologies, with local currency requirements being met through a participating firm's normal banking or other financing channels. Of the USAID equipment funds, on average, not more than 40 percent are expected to be grants to firms, to reimburse them for additional equipment and effort required to monitor the projects. The rest is expected to be a loan at normal commercial rates. This loan portion will be converted to Egyptian pounds at the official rate at the time the agreements are signed, and will be paid back in pounds. Loan repayments (or "reflows") will total approximately L.E. 40.2 million during the Project period, and L.E. 85.5 million after the project period.

Dollar costs were escalated at 5% annually and Egyptian pound costs derived from the GOE were escalated at 25% annually.

Recurrent costs in this project are as follows:

- Local costs associated with local transportation, installing, maintaining and monitoring the commodities purchased. These were estimated for the public and private sectors at L.E. 4.75 million each. These costs will be part of the GOE and private sector cash contribution to the project.

- Operating costs for the Project Secretariat, the Steering Committee and the Federation of Egyptian Industries were estimated at L.E. 7.0 million for years 6 to 8 of this project. This also will be a GOE contribution. In case the MOI would like to continue the current project organization after the project ends, funds from loan repayments, estimated at L.E. 85.5 million can be used to continue this project and meet the costs of introducing additional energy efficient technologies to other public sector industries.

The Project is financially feasible and a detailed financial analysis appears in Annex K.

VI. IMPLEMENTATION PLAN

A. Implementation Strategy:

The Project will be implemented over eight years and the Project Assistance Completion Date (PACD) is scheduled for September 30, 1996. The organizations playing key roles in Project implementation and management (MOI, TIMS, DRTPC, FEI, representative banks) participated directly in the Project's design and agree to its effectiveness.

B. Administrative Arrangements:

1. Implementing Agreement:

The Minister of International Cooperation (MIC) will be the signatory to the Project Grant Agreement (Pro Ag) and to all subsequent Pro Ag amendments.

2. Implementing Agencies:

The implementing agency for the private sector component of the Project will be Cairo University's Development Research and Technological Planning Center (DRTPC). The Director of DRTPC will appoint a full-time Executive Director to meet its responsibilities under the Project. The Ministry of Industry (MOI), through the Tabbin Institute for Metallurgical Studies (TIMS), will be the implementing agency for the Project's public sector component. The Minister of Industry will issue a decree establishing an Energy Conservation and Efficiency Project Steering Committee and a Project Secretariat under the umbrella of the MOI. The Minister of Industry will also appoint a full-time Executive Director for the Project Secretariat who will ensure that the Secretariat meets its project responsibilities.

3. Financing Arrangements:

The DRTPC, Project Secretariat (TIMS), and FEI will prepare annual plans which will include a review of the previous year's activities, a specific work plan, and an operating budget for the new year. These plans are to be submitted to USAID no later than July 1st of each year.

Annual funding levels for these organizations will depend on progress, performance, and projected annual requirements as determined by USAID in its monitoring and evaluation role. To help make this determination, USAID will annually audit selected technology applications in both the private and public sectors.

The initial funding split between the public and private sectors will be 50/50 (see Section II, Project Rationale). The project will be incrementally funded in three obligations. Before the second and third obligations are made, USAID will review the performance and demands of the private and public sector components to determine the amount of obligation and the funding share between the two sectors.

a. Technology Applications:

o Foreign exchange. USAID will fund the foreign exchange component of each technology application. Grants will be available to participating companies for a share of the foreign exchange cost of the commodities. The grant component is estimated to be 15 to 40 percent of the foreign exchange cost for small technology applications (those under $100,000) and 25 to 50 percent of the foreign exchange cost for large technology applications (those exceeding $100,000).

In order to determine where, within the above specified limits, a grant will be made for an individual technological application, the following guidelines are suggested:

1. The actual cost to the firm of installing the proposed technology, but excluding the CIF cost of the equipment. This includes the costs of proposal preparation, purchase of measuring equipment, installation costs, and the value of foregone production from existing capacity during the installation period due to the need to interrupt the production process.

2. The grant element may also cover the differential freight cost incurred in using a U.S. flag carrier. The project would pay the full CIF or C&F of the commodities cost. The user would pay the L.E. equivalent of the C or CI and a percentage of the actual cost U.S. liner shipping. The percentage discount would be determined to equate the cost of U.S. flag to non-U.S. flag carrier.

3. A 10% incentive discount of the L.E. equivalent of the cost of the commodity would be given to energy conservation improvements which effected an actual and significant (to be defined by the M/TA prior to start of procurement approval) reduction in the total energy used by the particular processes or product lines affected by the project.

4. A 5% incentive discount would be given for improvements which hold the total amount of energy used approximately constant for processes or product lines affected but reduced the energy required per unit of output (i.e. output increase). There should, however, be a threshold saving defined on a technical level by the M/TA contractor. The total grant arising from the above criteria would not exceed the overall grant limits unless approved by USAID.

The need for any additional incentives (such as larger grants, grace periods on interest payments), especially to encourage

private sector participation, will be reviewed regularly by USAID and adjusted as necessary.

The non-grant foreign exchange component will be lent to the companies by the participating banks. The banks will repay the Project for the foreign exchange "loan" at an exchange rate that is fixed upon executing the loan. They will collect principal and interest payments from the companies at their customary commercial terms and conditions. Funds will be made available by USAID to the banks through Bank Letters of Commitment (L/Com).

For each technology application, the banks will use the Bank L/Com to open letters of credit (L/Cs) with their corresponding banks in the U.S. in favor of the commodity and equipment supplier(s). Additional allocations will be issued through Bank L/Coms based upon use of funds and the bank's performance.

Participating banks will be those banks already participating in USAID's PIEF and CIP programs. They will sign a Participating Bank Agreement, which stipulates the rules, regulations, and procedures for using funds under the Project. This agreement will be modeled after the Participating Bank Agreement (General Circular No.1, Agreement No. 263-0201.1) for the Private Enterprise Credit Project, and will include eligibility requirements of borrowers, eligible activities and commodities, application, evaluation, and approval procedures, disbursement and repayment procedures, and documentation and reporting requirements. To the extend possible, processes and procedures used under the CIP for both public and private sectors will be used.

- o Local currency. The local currency component of technology applications will be financed by the companies either through equity or debt and will be arranged through participating banks. In the case of public companies, this may also involve the National Investment Bank. These loans will be subject to the banks' customary terms and conditions.

b. Technical and Management Services:

- o Foreign exchange. USAID will finance the foreign exchange component of all technical, management and administrative assistance, training, information dissemination, and any other Project activities.

- o Local currency. USAID will fund the local currency costs of the Management and Technical Assistance (M/TA) Contractor. For the first five years of the Project USAID will also fund the local currency costs of DRTPC, the Steering Committee, Project Secretariat, and the Federation of Egyptian Industries. Starting

in the sixth year, these costs will be financed from the Project's reflows.

c. Use of Reflows:

Public Sector: The loan repayments (or reflows) in Egyptian pounds from the foreign exchange loans to public companies will total approximately L.E. 14.9 million during the life of the Project assuming that: a) half of the commodity costs of $37.0 million will be allocated to the public sector; and that b) up to 50% of the costs will be in form of grants. These reflows will be placed in a special account administered by the Steering Committee but reviewed by USAID on a quarterly basis. The monies collected in this account will be used first to accrue sufficient local currencies to cover administrative and assistance costs of the Steering Committee, Project Secretariat, and FEI (for public sector activities only) for the last 3 years of the project, estimated approximately at L.E. 4.0 million; and second, approximately L.E. 8.4 million will be used to sponsor energy conservation research. The remaining funds estimated to be L.E. 2.0 million may be used to pay for the local currency portion of energy conservation investments by public industrial enterprises. Prior to using these reflows, the Steering Committee will submit for USAID approval, a plan for funds use and the procedures and mechanism for expenditures.

Private Sector: The loan repayments (or reflows) in Egyptian pounds from the foreign exchange loans to private companies will total approximately L.E. 25.3 million during the life of the Project.

These reflows will be placed in a special account administered by DRTPC but reviewed by USAID on a quarterly basis. The monies collected in this account will be used first to accrue sufficient local currencies to cover current and future administrative and assistance costs of DRTPC and FEI (for private sector activities) estimated at L.E. 3.0 million for the last three years of the project; and second to finance research on energy conservation and efficiency related to the private sector, estimated at approximately L.E. 5.0 million, and administered by DRTPC. The balance of L.E. 17.3 million will be used to provide loans to other private sector companies for purchasing energy efficient equipment. Prior to using these reflows, DRTPC will submit for USAID approval, a plan for funds use and the procedures and mechanism for expenditures.

C. Project Management and Responsibilities:

As shown previously in Figures III-1 and III-2, the Project is divided into two components -- one public sector and one private sector -- with management and technical assistance and information dissemination provided to both. The key responsibilities of the participating organizations are discussed below

and summarized in Figures VI-1 and VI-2. Project roles and responsibilities are described in detail in Annex H.

1. Private and Public Industrial Enterprises:

The responsibilities of public industrial enterprises and private industrial and commercial enterprises include:

- o Identifying technology applications
- o Providing sites for technology applications
- o Preparing and submitting proposals
- o Providing local currency for technology applications
- o Installing and operating technologies
- o Monitoring technology performance

2. Development Research and Technological Planning Center (DRTPC):

DRTPC is the implementing agency for the private sector component and has the following management and technical services responsibilities:

- o Project administration, accounting, and financial management
- o Supervising FEI's promotion activities
- o Identifying technology applications
- o Evaluating technical, economic, and replication feasibility of proposals
- o Approving proposals up to $1 million
- o Determining loan/grant split if grant is no more than 40 percent of funds to be provided by USAID for technology application
- o Technical assistance and training for private companies at all stages of technology application, including proposal preparation
- o Monitoring and tracking technology applications
- o Analyzing and presenting results of technology applications
- o Administering special account consisting of loan repayments from the private sector (Reflows)
- o Monitoring the cash and in-kind contribution of the private sector to the project.

3. Ministry of Industry:

The Ministry of Industry will implement the public sector component. This component will be managed by a Project Secretariat, with guidance and approval from a Steering Committee.

a. Steering Committee: The Chairman of the Steering Committee will be the Minister of Industry or his designated representative. The Steering Committee will be composed of the Minister of International Cooperation or his designee, the Executive Director of the Project Secretariat, the Director of the Tabbin Institute for Metallurgical Studies, the Chairman of the Federation of Egyptian Industries, the

FIGURE VI–1

SUMMARY MANAGEMENT AND IMPLEMENTATION RESPONSIBILITIES: PRIVATE SECTOR COMPONENT

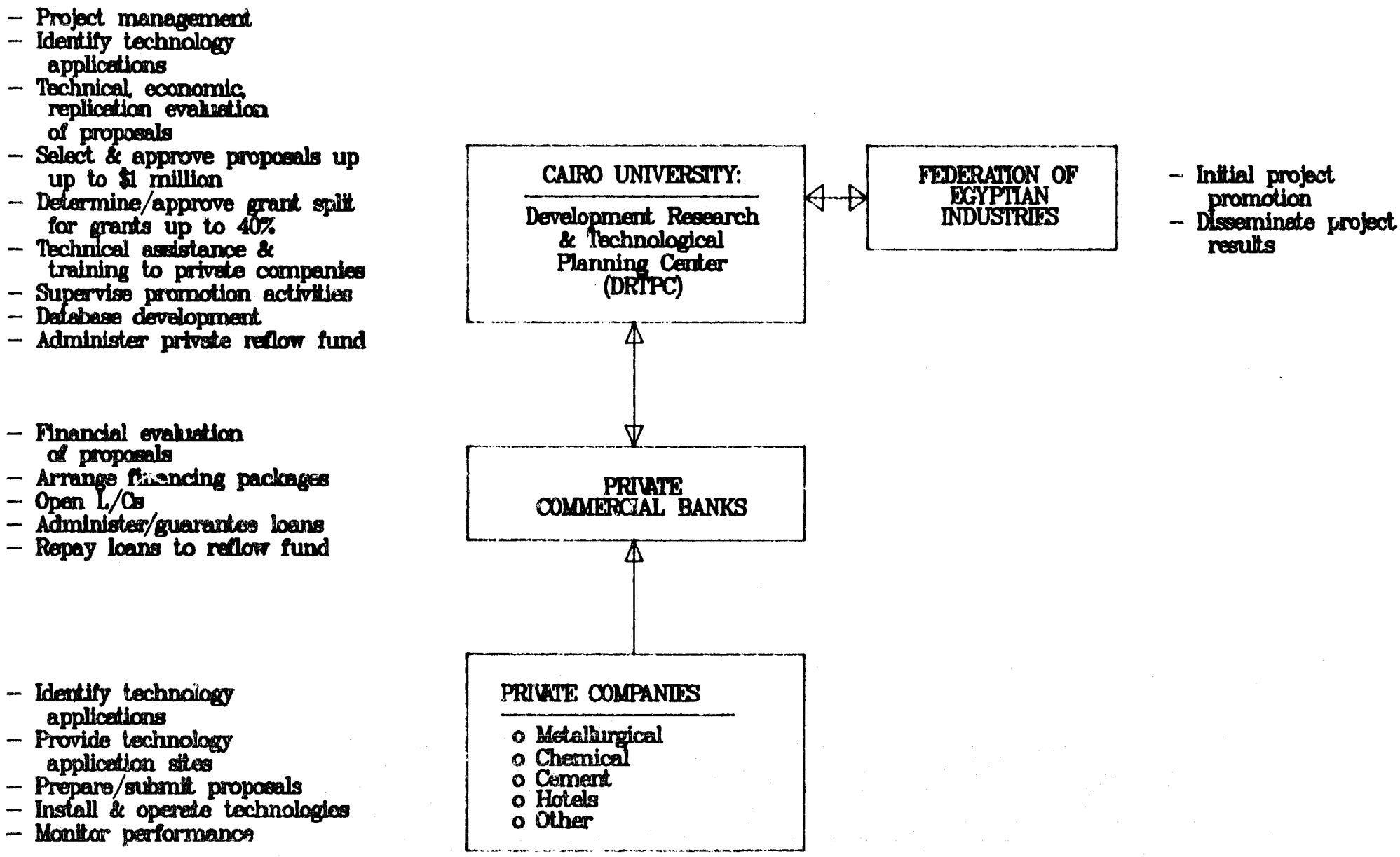
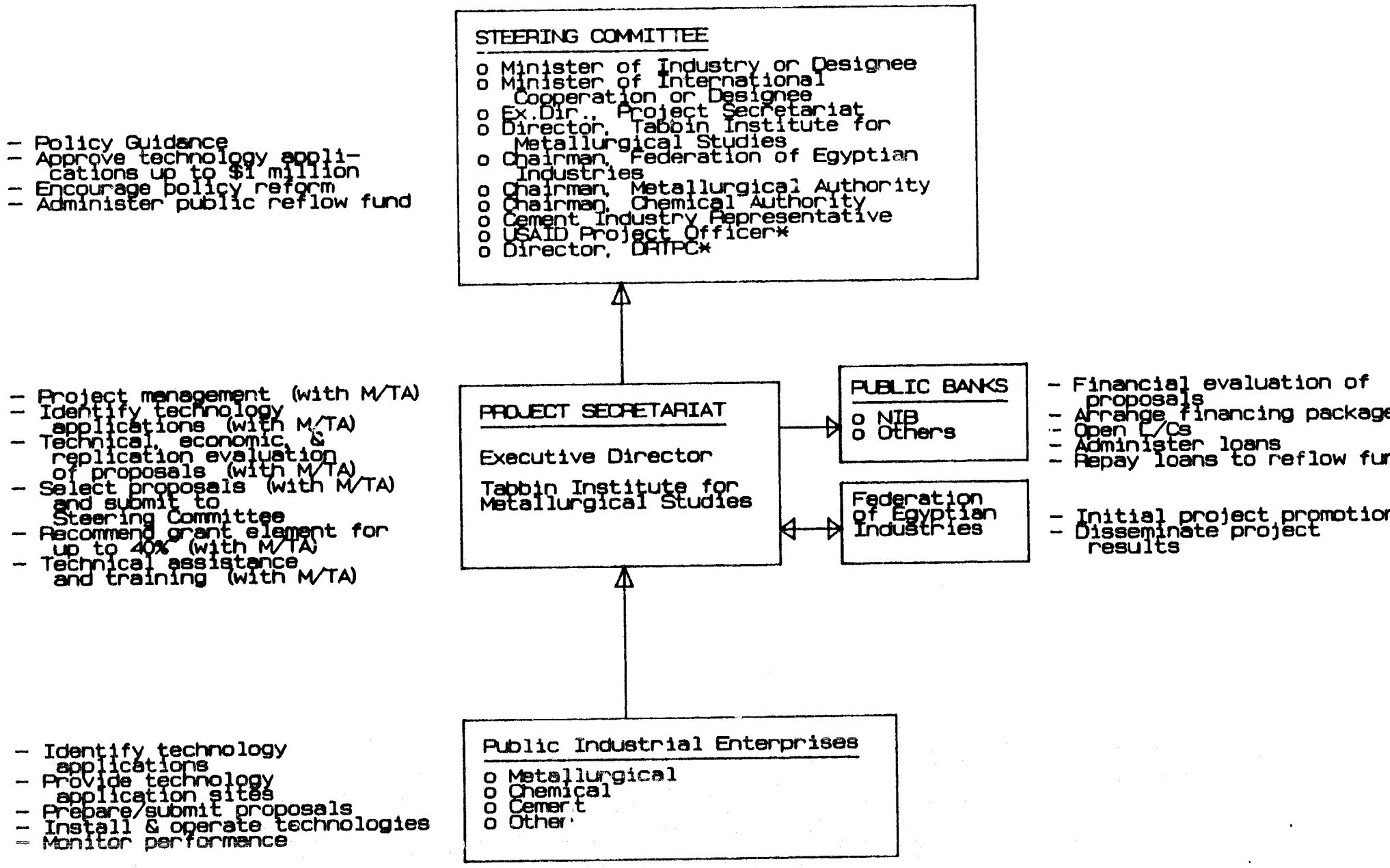


FIGURE VI-2

SUMMARY MANAGEMENT AND IMPLEMENTATION RESPONSIBILITIES: PUBLIC SECTOR COMPONENT



Chairmen of the Metallurgical and Chemical Authorities, a representative of the cement industry, the USAID Project Officer (ex-officio), and the Director of DRTPC (ex-officio). The Steering Committee's responsibilities include:

- o Providing overall policy guidance to the public sector component
- o Approving technology applications for up to $1 million
- o Encouraging GOE policymakers to remove policy barriers to energy conservation
- o Administering revolving funds generated from loan repayments (Reflows).

b. Project Secretariat: The Project Secretariat is responsible for day-to-day project management and implementation of the public sector component. It will be staffed by TIMS and an Executive Director, with technical and management responsibilities for:

- o Project administration, accounting, and financial management including an annual plan
- o Identifying technology applications
- o Evaluating technical, economic, and replication feasibility of proposals
- o Selecting proposals and submitting them to Steering Committee for final approval
- o Recommending loan/grant split if grant is not more than 40 percent of funds to be provided by USAID for technoloogy application
- o Providing technical assistance and training to public industrial enterprises at all stages of technology application, including proposal preparation
- o Monitoring and tracking technology applications and their funding
- o Analyzing and presenting results of technology applications
- o Submitting budget and expenditure plans for using reflows to the Steering Committee
- o Monitoring the GOE cash and in-kind contributions to the project.

TIMS will carry out its activities with assistance from the M/TA contractor.

4. Public and Private Commercial Banks:

Participating banks will arrange and administer the financing for technology applications in both the public and private sector components. Their responsibilities will include:

- o Marketing the Project to their clients
- o Financial evaluation of technology application proposals
- o Preparing financing packages for technology applications
- o Opening Letters of Credit for commodities and equipment
- o Arranging local currency component of technology application

- o Administering and guaranteeing loans
- o Repaying foreign exchange loans (in Egyptian pounds) into reflow fund

5. Federation of Egyptian Industries (FEI):

FEI will provide project promotion and information dissemination services to both the private and public sector components. FEI's responsibilities include:

- o Project promotion throughout Egypt through seminars, publications, and radio and television advertisements
- o Assisting DRTPC in developing energy conservation data base
- o Publicizing results of technology applications

6. USAID:

USAID will be primarily responsible for Project funding (see VI-F for details) and monitoring (see VI-G for details), including:

- o Contracting and administering the M/TA contract
- o Approving technology applications of more than $1 million or where the recommended grant is more than 40 percent of the total funds to be provided by USAID for the technology application
- o Conducting audits of selected technology applications
- o Reviewing and approving annual funding plans for DRTPC, TIMS, and FEI
- o Initiating Project evaluations

The S&T Project Officer will be assisted by other USAID personnel as needed.

Exhibit VI-1 presents the Project's 10 major management and implementation tasks and indicates which organizations perform, monitor, approve, and fund them. Details on the Project's staffing requirements appear in Annex K.

D. Procurement Plan:

1. Interim U.S. Contractor: Energy Conservation Services Program (ECSP)

Because selecting a long-term M/TA contractor can take up to eight months, and as the initial technology applications are already identified, USAID will buy-into the AID/Washington contracted Energy Conservation Services Program to provide 50 pm of services:

a. Assisting TIMS in developing the Project Steering Comittee and Secretariat and in identifying policies and procedures for technical review, management, and accounting of subprojects.

Exhibit VI-1

Implementation Tasks and Responsbilities

	Public Sector Component			Private Sector Component		
	Performs Task	Monitors/ Assists Task	Funds Task	Performs Task	Monitors/ Assists Task	Funds Task
·oject management	PS	M/TA	USAID/GOE	DRTPC	M/TA	USAID
·oject promotion/ lvertising	FEI	M/TA	USAID/GOE*	FEI	DRTPC	USAID/GOE*
·chnology application lentification	Co, PS	M/TA	Co, USAID/GOE*	Co, DRTPC	DRTPC (M/TA)	Co, USAID
·oposal preparation	Co	PS (M/TA)	Co	Co	DRTPC (M/TA)	Co
·oposal evaluation and ·lection	PS	M/TA	USAID/GOE*	DRTPC	M/TA	USAID
·oposal approval	SC	USAID** (M/TA)	USAID/GOE*	DRTPC	USAID** (M/TA)	USAID
nancing package ·eparation	Bank(s)	SC	Bank(s)	Bank(s)	Bank(s)	Bank(s)
·tailed engineering, ·ocurement, installation	Co,V,A/E	PS,M/TA	-	Co,V,A/E	DRTPC (M/TA)	-
local costs	-	-	Co (GOE)	-	-	Co
foreign exchange costs	-	-	USAID	-	-	USAID
·rformance monitoring	Co	PS(M/TA)	USAID	Co	DRTPC (M/TA)	USAID
ıformation dissemination	FEI,EBA	PS(M/TA)	USAID/GOE*	FEI	DRTPC (M/TA)	USAID/GOE*

SAID will fund local currency costs of these tasks for the first five years of the project. :arting in the sixth year, these tasks will be financed by the GOE out of the project's ·flows.

ɔr technology applications of more than $1 million or if the proposed grant is more than 40% : the total funds to be provided by USAID for the technology application, USAID approval is ·quired.

ıd:

= Steering Committee
= Project Secretariat
= Government of Egypt
= Federation of Eygptian Industries
: = Development Research and Technology Planning Center

Co = Public or private company
M/TA = Management and Technical Assistance Contract
Bank(s)= Commercial Banks and National Investment Ban
V = Equipment vendor/manufacturer
A/E = Architecture/Engineering Firm

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b. Conducting detailed feasibility studies of the preidentified subprojects in the public and private sectors (see exhibit VI-2).

c. Preparing, with DRTPC and FEI, a marketing strategy for attracting private sector firms, and disseminating project information and announcements to the private and public sectors.

d. Assisting USAID in contacting, selecting and mobilizing participating banks.

e. Initiating a number of long-lead-time technical and policy studies in support of project implementation.

2. Management/Technical Assistance Contractor (M/TA):

During the first year of project implementation, USAID will contract the services of a U.S. consulting firm to assist DRTPC, TIMS and FEI in implementing this project. An AID direct contract mode was selected because the M/TA contractor will be providing management and technical assistance to both the public sector (TIMS, FEI, public companies) and the private sector (DRTPC, private companies), as well as advisory services to USAID. In addition, TIMS, DRTPC, and FEI have no experience with administering host country contracts. Finally, given the M/TA's important USAID advisory role, especially approving technology applications and evaluating TIMS' and DRTPC's performance, it was concluded that a host country contract was not appropriate for this project.

The M/TA contractor responsibilities are:

- Providing management, technical assistance and training services to DRTPC, FEI, TIMS, and private and public enterprises at all project stages
- Advising USAID on whether technology applications should be approved and funded
- Reporting regularly to USAID on Project status and performance
- Assisting the Project Secretariat in formulating policies and procedures for the use of reflows
- Providing PSA services as requested by project participants

These responsibilities are amplified in Annex H (Administrative Analysis), and the M/TA contractor's scope of work is found in Annex O. In meeting its responsibilities, the M/TA contractor will provide the following services:

a. Project Management: A resident project manager, as well as a U.S. liaison officer, for a total of 144 pm to oversee overall Project activities and assist TIMS and DRTPC with day-to-day project management and monitoring, and coordinating the private and public sector components.

Exhibit VI-2

Preliminary List of Potential Technology Applications
(All Costs in 1987 US$ and LE)

Sector/Company	Project	Approximate Cost Local LE	Approximate Cost Foreign US$	Approximate Economic Payback (Yrs)
PRIVATE SECTOR				
1. Suez Cement	Power generation from waste flue gas recovery (bottoming cogeneration)	690,000	1,200,000	3-5
2. Suez Cement	Energy management system	270,000	300,000	2-3
3. Al Shinnawy Steel	Recuperator on reheat furnace	13,500	35,000	1
TOTAL PRIVATE SECTOR PROJECTS		973,500	1,535,000	
PUBLIC SECTOR				
Metallurgical				
4. Delta Steel	Scrap preparation and pre-heating automatic system	135,000	150,000	1.5
5. Delta Steel	Furnace electric load management system	200,000	350,000	2
6. National Metals	Waste heat recovery boiler	54,000	60,000	3-4
7. Egyptian Iron & Steel	Complete rehabilitation of reheat furnace with improved waste heat recovery, process & combustion controls and adequate upstream (oxygen convertor) & downstream (rolling mill) improvement	475,000	650,000	2
Chemicals				
8. Abu Zaabal Fertilizer	Cogeneration system to sell excess power to EEA (2 MW)	1,296,000	2,240,000	3-5
9. El Nasr Coke/Chemicals	Fluidized bed pilot combustor (El Tabbin Power Station)	540,000	600,000	3-5
10. Abu Kir Fertilizer	Automatic Power Factor Control System (10 MVA)	54,000	160,000	2
11. Misr Chemicals	Steam Cogeneration System	1,215,000	2,100,000	3-5
12. Rakta Paper	Waste heat recovery from paper machine	54,000	50,000	2
TOTAL PUBLIC SECTOR PROJECTS		4,023,000	6,360,000	
TOTAL 12 PROJECTS		4,996,500	7,895,000	
AVERAGE COST PER PROJECT		416,375	657,917	2

b. Long-term and short-term U.S. consultants: Consultants will assist DRTPC, TIMS and private and public sector companies for a total of 300 pm in: (1) performing energy audits and feasibility studies; (2) reviewing and approving all technology application proposals; (3) marketing energy conservation and efficiency activities; (4) Training services to DRTPC, TIMS, FEI, private and public enterprises at all project stages.

c. Training: The contractor will identify training centers, universities and A/E firms to arange training for 45 persons for a total of 200 pm. The contractor will prepare training manuals and wil assist DRTPC and FEI in offering local training courses to bankers, industrialists, and A/E firms.

d. Procurement Services Agent (PSA) services: The contractor will perform PSA services for private and public sector firms such as assisting in developing technical specifications, preparing Requests for Quotations and Invitations for Bids, assisting in analyses and selecting winning offers.

e. Marketing and Promotion services: The contractor will assist DRTPC, FEI and TIMS in organizing workshops and seminars, establishing a project information center, and conducting promotion and marketing services with TIMS and FEI, DRTPC for private and public sector firms.

3. Local Management Services:

USAID will provide grants to DRTPC, TIMS and FEI for:

a. Assisting in establishing their offices
b. Recruiting technical and administrative personnel
c. Procuring offfice equipment, materials and supplies
d. Subcontracting Egyptian consultants for technical services
e. Arranging or conducting local training, workshops and seminars

4. Monitoring Support Services:

USAID will also contract for the services of:

a. Short-term consultants to assist the project officer in conducting technical audits of selected technology applications to ensure that they have been selected in accordance with criteria established by USAID.

b. Two Indefinite Quantity Contractors (IQC's): the first to conduct two external project evaluations, and the second to audit the project.

5. Commodities Procurement:

In both the private and public sectors, end-users will have primary responsibility for developing technical specifications for the technologies to be installed, releasing the RFQ/IFB, analyzing bids and selecting the winning offer. With the assistance of the M/TA contractor, TIMS will have the responsibility for ensuring that the procedures used to select the winning offer by the public sector firms, are in compliance with USAID procurement regulations. For private sector installations, DRTPC and the M/TA contractor will have that responsibility.

Exhibit VI-3 and VI-4 list the major proposed procurement steps required from identifying to installing the specific applications. These can be modified during implementation, for the purpose of speeding up the procurement process.

Waiver:

To facilitate the procurement process, a waiver (Annex M) from USAID procurement regulations set forth in Handbook 11, chapter 3, is proposed: This will allow procurement procedures to fall under Handbook 15, chapter 3, section 3.B.1., which uses AID Regulation 1 for the Commodity Import Program (CIP). Reg. 1 procedures are known to the public, private and banking sectors. This is important to Project success. In particular, private sector firms are very concerned that unncecessarily stringent requirements will delay procurement and implementation while increasing administrative costs. In addition, installing these technologies in some cases make it difficult to define precise technical specifications at present. Finally, these technologies can be an integral part of an industrial process, and will likely affect the entire process or product quality. Thus cost alone may not be the best determinant of the best option.

Gray Amendment:

Careful consideration will be given to Early Alert identification of opportunities for minority, Small Businesses, 8 (a), and women-owned firms, minority-controlled Private Voluntary Organizations, and Historically Black Colleges and Universities. In particular, the RFP for the M/TA contractor will require that all M/TA proposals include a plan for minorities participating in Project implementation.

E. Training Plan:

The objectives of the training program are to (1) develop end-user skills and capabilities to adopt and assimilate energy efficient technologies in industry and (2) upgrade the skills of local institutions to support and accelerate this process.

EXHIBIT VI-3

PROCUREMENT PROCEDURES FOR PRIVATE SECTOR FIRMS

- Potential technology is identified and assessed by the Bank and DRTPC, with M/TA contractor assistance if needed.
- If technically, financially, and economically attractive, it is submitted to DRTPC and Bank for approval.
- If DRTPC with M/TA assistance approves the proposal*, procurement is initiated by USAID earmarking the necessary funds in a PIL to DRTPC.
- Bids will be solicited and evaluated by the importer who will notify the bank of his decision in writing. If award is to other than lowest bidder, a written justification will be provided. The bank will review the successful bidders compliance with USAID regulations.
- M/TA with DRTPC assistance will review the award and if it is acceptable will issue a No Objection letter to the importer and the Bank.
- DRTPC will request USAID to open a Bank L/Com to the Bank selected by the importer.
- The bank opens the L/C which is confirmed by the US bank handling the applicable L/Com.
- The importer completes a U.S. Customs export license application and initiates actions to obtain necessary import licenses and other documents and approvals required by GOE rules and regulations.
- The L/C bank pays into the Project Special Account an amount in Egyptian pounds (LE) equal to the non-grant portion of the commodity import cost. The US$ are converted to LE at the official conversion rate at that time.
- The supplier ships the commodities, and submits USAID Forms 11 and 282 to the L/Com bank for payment.
- The commodities are received and cleared through Egyptian customs.

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* Intermediate step in included and requires USAID approval in case:
a. The technology application cost is above $1.0 million
b. The grant portion of the technology application is above 40% of the total cost irrespective of the total value of the technology application

EXHIBIT VI-4

PROCUREMENT PROCEDURES FOR PUBLIC SECTOR FIRMS

- Potential technology is identified and assessed by user (i.e., importer) and Technical Secretariat, with M/TA assistance if needed.
- If technically, financially, and economically attractive, it is submitted by the Technical Secretariat to the Steering Committee for approval.
- If the Steering Committee approves the proposal*, the Technical Secretariat submits to USAID a request to earmark the necessary funds.
- If USAID approves the proposal in a PIL to the Technical Secretariat, and procurement is initiated using AID Regulation 1.
- Bids will be solicited and evaluated by the importer who will notify the Technical Secretariat of his decision in writing. If award is to other than lowest bidder, a written justification will be provided. The Technical Secretariat will insure the award is in compliance with USAID regulations.
- M/TA will review the award and if it is acceptable will request the Technical Secretariat to issue a No Objection letter to the Bank and the importer.
- The Technical Secretariat will request USAID to open a Bank L/Com to the Bank selected by the importer.
- The bank opens the L/C which is confirmed by the US bank handling the applicable L/Com.
- The importer completes a U.S. Customs export license application and initiates actions to obtain necessary import licenses and other documents and approvals required by GOE rules and regulations.
- The supplier ships the commodities, and submits USAID Forms 11 and 282 to the L/Com bank for payment.
- The commodities are received and cleared through Egyptian customs.
- The L/C bank pays into the Project Special Account an amount in Egyptian pounds (LE) equal to the non-grant portion of the commodity import cost. The US$ are converted to LE at the official conversion rate at that time.

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* An intermediate step is included and requires USAID approval in case:
a. The technology application cost is above $1.0 million.
b. The grant portion of the technology application is above 40% of the total cost irrespective of the total value of the technology application

A total of 1250 persons will be trained during the life of the Project; approximately 45 will receive training in the US. Most training activities will focus on developing the skills of technical and management personnel in participating plants in the following areas: proposal preparation, system design, procurement, installation, operation, and monitoring of energy efficient technologies. Local A/E firms will also require some training to adapt US technology design and operating characteristics to Egyptian conditions. Limited training will also be provided to DRTPC, TIMS, FEI, and participating commercial banks. The overall training program will be developed by the M/TA contractor by November 1989. This training program will be based on a detailed needs assessment developed in close collaboration with all project participants (e.g., DRTPC, Project Secretariat, FEI, and companies).

Annex I provides more details on the Project's training and manpower development program.

F. Financial Plan and Funding Flows:

1. Cost Model:

The technical needs assessment conducted during project analysis identified 10 generic categories of energy-efficient technologies to be applied in five key sectors: cement, chemicals, metals, textiles, and food. In order to best meet these needs and the criteria of the Project (such as replicability in at least five other plants), a model of a technology application has been developed and discussed with private and public sector representatives. This model subproject is shown in Exhibit VI-5.

Each generic technology consists of a number of specific pieces of equipment. In the case of the generic technology "Waste Heat Recovery Systems,: the specific pieces include (See Annex D for details):

- o Condensing heat exchangers
- o Ceramic and non-ceramic recuperators
- o Heat pipes
- o Shell-in-tube heat exchangers
- o Flat plate heat exchangers, and
- o Air preheaters and economizers

The costing basis for each technology is the following: First, a CIF foreign exchange median cost is estimated for each technology application, based on quotes reviewed in-country and design team experience and data. Next, local costs are estimated using the same sources. On average, the split between foreign cost and local cost is 60/40. As an example, if the cost of a heat exchanger is $90,000 FOB U.S. and $100,000 CIF Egypt, the local costs will be approximately U.S. $100,000 x 40/60 = $66,000 or L.E. 145,200. Of the local cost, 45% was estimated to be in cash and 55% to be in-kind.

EXHIBIT VI-5

ILLUSTRATIVE TECHNOLOGY APPLICATIONS PROGRAM - FOREIGN EXCHANGE CAPITAL COSTS* ONLY

(US $000 000)

	PROCESS CONTROLS		ENERGY MGMT		COMBUS CONTROLS		WASTE HEAT REC		COGENER-ATION		HI-EFF MOTORS		PWR FCTR IMPROV		ADV INSUL		SOLID COMB		HI-EFF LIGHTS		TOT
	#	UNIT COST	#	UNIT COST	#	UNIT COST	#	UNIT COST	#	UNIT COST	#	UNIT COST	#	UNIT COST	#	UNIT COST	#	UNIT COST	#	UNIT COST	#
INDUSTRY SECTOR:																					
Private:																					
Cement	1	0.50					1	1.00	1	2.50	1	0.50	1	0.50	1	0.50					6
Metals	1	0.30			1	0.25	2	0.20	1	1.00	1	0.10	1	0.20	1	0.20					8
Chemicals	1	0.50	1	0.50	1	0.25			1	1.00					1	0.20	1	1.00			6
Textiles			1	0.20	1	0.20	1	0.20	1	1.00			1	0.20	1	0.20	1	1.00	1	0.10	8
Food	1	0.50	1	0.20	1	0.10	2	0.20	1	2.00	1	0.20					1	0.50	1	0.10	9
Other																					
SUBTOTAL:	4	1.8	3	0.9	4	0.8	6	1.6	5	7.5	3	0.8	3	0.9	4	1.1	3	2.5	2	0.2	37
Public:																					
Chem/Fert	1	1.00	1	0.50			1	1.00	2	2.50	1	0.50	1	0.50	1	0.50	1	1.00			9
Metals	1	0.50	1	0.50	2	0.50	2	0.50	1	2.00	1	0.50	1	1.00	1	0.50					10
Other			1	0.50	1	0.50	1	0.30			1	0.20									4
SUBTOTAL:	2	1.5	3	1.5	3	1	4	1.8	3	4.5	3	1.2	2	1.5	2	1	1	1	0	0	23
GRAND TOTAL:	6	3.3	6	2.4	7	1.8	10	3.4	8	12	6	2	5	2.4	6	2.1	4	3.5	2	0.2	60

* - includes equipment capital costs, installation costs, and maintenance and monitoring contracts

Source: plant visits and energy audit reviews

As shown in Exhibit VI-5, the total foreign exchange cost is $37 million for 60 technology applications, broken down as follows:

Process Controls: 6
Energy Management Systems: 6
Combustion Controls: 7
Waste Heat Recovery Systems: 10
Cogeneration Systems: 8
High Efficiency Electric Motors: 6
Power Factor Improvement Systems: 5
Insulation Materials: 6
Solid Fuel-fired Combustors: 4
High Efficiency Lighting: 2

The above closely reflects industry needs, although actual implementation is likely to result in a slightly different mix of technology applications.

2. Summary of the Financial Plan:

The AID contribution over the eight year life of project is $49.5 million. The GOE contribution is L.E. 70.5 million.

Table VI-8 summarizes the illustrative budget. Table VI-9 shows the inputs (Technical assistance, commodities) as a function of project outputs (Technology application and Institutional Development). Illustrative tables for each of the budget categories are in Annex K.

AID input will be a grant to the GOE, incrementally funded with an initial obligation of $15.0 million for FY 88. Subsequent obligations for FY 90 and FY 92 are $11.1 million and $23.4 million respectively. These are subject to the availability of funds and USAID decision to allocate the necessary budget for the categories shown in Table VI-8. The incremental funding is based on the obligation plan and planned expenditures of USAID funds shown in Tables VI-10a and b.

AID will fund the foreign exchange costs of the commodities, estimated at $37 million, including the cost of equipment, maintenance services and installation.

The balance of the AID Grant of $12.5 million will fund technical assistance and management assistance in both local and foreign currency to both the public and private sector firms participating in this project.

The GOE will match the AID grant/loan of the commodities with an estimated cash contribution of L.E. 12.5 million of which L.E. 8.1 million will be used to finance the local costs of the energy equipment and will cover personnel costs, facilities and construction costs. The GOE in-kind contribution will be LE 25.2 million. In addition, the GOE will provide LE 4.4 million cash to fund the local currency requirements for management services.

Table VI-8
Illustrative Budget Summary (000)

	AID Contribution			GOE Contribution		Private Sector		Host Country Total
	FX $	LC $	Total $	In-kind LE	In-cash LE	In-kind LE	In-cash LE	
Commodities	37000.00	-	37000.00	24200.00	8100.00	16200.00	16200.00	64700.00
.Technical Serv.								
Technical Assist.	7088.73	-	7088.73					
Training	1911.27	-	1911.27	400.00	-	400.00	-	800.00
BTOTAL II	9000.00	-	9000.00	400.00	-	400.00	-	800.00
I.Local Mgt & Serv.								
Public Sector	-	1430.00	1430.00	530.00	3825.00	-	-	4355.00
Private Sector	-	950.00	950.00	30.00	-	-	-	30.00
Information Dissemination	-	220.00	220.00	40.00	575.00	-	-	615.00
BTOTAL III	-	2600.00	2600.00	600.00	4400.00	-	-	5000.00
. Evaluation/Audit	900.00	-	900.00	-	-	-	-	-
AND TOTAL	46900.00	2600.00	49500.00	25200.00	12500.00	16600.00	16200.00	70500.00

Table VI-9
Inputs and Outputs $(000)

Outputs / puts	Technology Application		Capacity Building			Total
	Equipment	Technical Services	Training	Information	Evaluation	
Tech. Assistance	-	9468.73	1911.27	220.00	900.00	12500.00
. Commodities	37000.00	-	-	-	-	37000.00
TAL	37000.00	9468.73	1911.27	220.00	900.00	49500.00

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TABLE VI-10.a.
OBLIGATION PLAN $(000)

Item	FY 88 FX	FY 88 LC	FY 89 FX	FY 89 LC	FY 90 FX	FY 90 LC	FY 91 FX	FY 91 LC	FY 92 FX	FY 92 LC	FY 93 FX	FY 93 LC	FY 94 FX	FY 94 LC	TOTAL FX	TOTAL LC	GRAND TOTA
I. Commodities	6475.00	0.00	0.00	0.00	11100.00	0.00	0.00	0.00	19425.00	0.00	0.00	0.00	0.00	0.00	37000.00	0.00	37000.00
II. Technical Services	5963.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3036.85	0.00	0.00	0.00	0.00	0.00	9000.00	0.00	9000.00
III. Management Support Services	0.00	2311.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	288.65	0.00	0.00	0.00	0.00	0.00	2600.00	2600.00
IV. Evaluation and Audit	288.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	611.68	0.00	0.00	0.00	0.00	0.00	900.00	0.00	900.00
TOTAL OBLIGATIONS	12726.47	2311.35	0.00	0.00	11100.00	0.00	0.00	0.00	23073.53	288.65	0.00	0.00	0.00	0.00	46900.00	2600.00	49500.00
TOTAL FY		15037.82		0.00		11100.00		0.00		23362.18		0.00		0.00			49500.00

TABLE VI-10.b.
EXPENDITURE PLAN $(000)

Item	FY 89 FX	FY 89 LC	FY 90 FX	FY 90 LC	FY 91 FX	FY 91 LC	FY 92 FX	FY 92 LC	FY 93 FX	FY 93 LC	FY 94 FX	FY 94 LC	FY 95 FX	FY 95 LC	TOTAL FX	TOTAL LC	GRAND TOTAL
I. Commodities	1850.00	0.00	4625.00	0.00	5550.00	0.00	5550.00	0.00	5550.00	0.00	5550.00	0.00	8325.00	0.00	37000.00	0.00	37000.00
II. Technical Services	1636.67	0.00	1516.82	0.00	1532.26	0.00	1277.41	0.00	1112.04	0.00	982.38	0.00	942.42	0.00	9000.00	0.00	9000.00
III. Management Support Services	0.00	745.42	0.00	489.61	0.00	520.06	0.00	556.26	0.00	288.65	0.00	0.00	0.00	0.00	0.00	2600.00	2600.00
IV. Evaluation & Audit	38.13	0.00	109.59	0.00	110.95	0.00	29.66	0.00	31.15	0.00	32.70	0.00	547.82	0.00	900.00	0.00	900.00
TOTAL EXPENDITURES	3524.80	745.42	6251.41	489.61	7193.21	520.06	6857.07	556.26	6693.19	288.65	6565.08	0.00	9815.24	0.00	46900.00	2600.00	49500.00
TOTAL FY		4270.22		6741.02		7713.27		7413.33		6981.84		6565.08		9815.24			49500.00

The Egyptian private sector, including private commercial banks, will provide approximately LE 16.2 million cash to fund the local currency requirements for equipment, services, and installation. This will be in the form of loans from banks and equity contributions from participating industrial enterprises. The private sector will also provide approximately LE 16.5 million as an "in-kind" contribution of installation, salaries, and for management services.

3. Uses of Funds:

Exhibit VI-6 summarizes the methods of implementation and financing. Seventy-five percent of the total Project funds will go to purchasing and installing advanced energy technology equipment. Technical services (e.g., audits, technology evaluations) to identify and determine the feasibility of specific technologies are estimated at $8.5 million.

G. Monitoring Plan:

1. Public Sector Component:

The primary responsibility for monitoring day-to-day activities is vested in the Project Secretariat (TIMS) and its Executive Director. Annual progress reports summarizing activities, achievement of objectives, problems and resolutions will be prepared by the Project Secretariat and submitted to USAID. TIMS will develop a technology application status tracking system and submit detailed status reports to the M/TA contractor and USAID on a quarterly basis. These quarterly reports will include the number of proposals, approvals, on-going technology applications, sectors of application, types of technology applications, size of investments, status and performance of applications, implementation schedules, and status of the information dissemination program.

The participating banks will provide USAID with monthly reports showing all approved transactions for technology application. Copies of all other relevant documents for each technology application (e.g., L/Cs, Bills of Lading, Supplier's Invoice) shall also be presented on a monthly basis.

Public companies participating in the Project will monitor the performance of technology applications and provide the agreed-upon information on a monthly basis to TIMS.

2. Private Sector Component:

The private sector component activities will be monitored on a day-to-day basis by DRTPC. DRTPC will be responsible for providing USAID with the same information and in the same progress reports format for the private sector as is required of TIMS for the public sector.

Exhibit VI-6

Methods of Implementation and Financing

Services	Methods of Implementation	Methods of Financing	HC or AID Contract	Estimated Value $(000)	GOE Implementing Units
1. Equipment & Services	Project Implementation Letters	B/LCom, L/C	HC	37,000	DRTPC & TIMS
2. Interim Contractor	AID Direct	Direct Pay	AID	950	
3. Management/TA Contractor	AID Direct	Direct Pay	AID	8,050	
4. Local Management Services, Public Sector	Project Implementation Letters	Direct reimbursement with advance	HC	1,430	TIMS
5. Local Management Services, Private Sector	Project Implementation Letters	Direct reimbursement with advance	HC	950	DRTPC
6. Information & Dissemination	Project Implementation Letters	Direct reimbursement with advance	HC	220	FEI
7. Evaluation/Audit	AID Direct	Direct pay	AID	900	
		TOTAL		49,500	

Participating banks and private companies will be responsible for monitoring their respective activities and providing the same information to USAID and DRTPC required under the public sector component.

3. M/TA Contractor:

The M/TA contractor will report regularly to USAID on the status of both the private and public sector components and will advise USAID on DRTPC's and TIMS' performance. This reporting will include brief status reports as part of monthly invoices and detailed quarterly reports. These reports will also include information on all technical assistance, training, and special studies which have been carried out by the M/TA contractor.

4. USAID:

USAID's primary monitoring role will be to ascertain the effectiveness of the overall implementation process and compliance with Project policies and procedures. Monitoring activities will include: operating procedures (e.g., financial, procurement, contracting, subproject policies); annual subproject implementation and financial plans; and progress reports submitted to USAID by DRTPC, the Project Secretariat, and the M/TA contractor.

In addition, USAID will request TIMS and DRTPC to provide information on the cash and in-kind contributions of the public and private sectors respectively. This information will be available to these two institutions, as they have to approve financing packages that the private/public sector firms submit to the banks for securing loans in foreign exchange and local currency. As part of a Project Implementation Letter (PIL), USAID will list the eligibility requirements of companies, including specific public companies that will not be eligible to participate in the Project. In addition, USAID will annually conduct audits of selected technology applications to ensure they have been selected in accordance with criteria established by USAID.

H. Evaluation Plan:

As a pioneering effort in financing demonstrations of energy conservation technologies to encourage their wide dissemination in Egypt, this Project's experience will be of interest and value to a broad audience within the GOE, USAID, other donors, and other countries. It is important, therefore, that the Project receive careful evaluation both during and after its lifetime. There will be two formal outside evaluations of the Project: a mid-point evaluation to be completed by January 1992 and a final evaluation to be completed at the end of the Project.

The key questions to be answered in evaluating the Project are:

- Have the technologies installed met their objective of saving energy?
- Have there been additional installations of these technologies at other plants in Egypt?

- Have Egyptian private sector organizations established a capability for delivering energy conservation technologies without significant external assistance?

The answer to the first question should be easily determined through the monitoring process which is built into the Project. This assessment should also determine the reasons for achieving these savings, particularly if the savings differ significantly (by 30 percent or more) from those estimated in the initial feasibility analysis for that site. This will allow better estimates of the expected savings to be made for other installations of that technology. To a large extent, this assessment will be made continually by DRTPC, TIMS, and the M/TA contractor as part of their ongoing monitoring efforts. Summary reviews of these savings will be compiled to assist in determining if modifications to the Project design are necessary.

Determining whether additional installations of a demonstrated technology have occurred is more difficult, since not all additional installations will be brought to the attention of the Project team. However, reasonable estimates of replications can be determined from discussions with equipment vendors of that technology, from follow-up calls on those organizations which visited the installation or requested information on it, and from the results of annual questionnaires sent to FEI members.

These FEI questionnaires will further assist Project evaluation by seeking advice on how the Project might be improved (e.g., which types of technologies should be developed, and why did or why did not a respondent select a demonstrated technology applicable to his plant).

Finally, an assessment must be made of the capability of Egyptian organizations to provide energy conservation technologies without external assistance after the Project is completed. This can be done through discussions with energy users, equipment vendors, engineering service organizations, financial institutions, and trade associations.

The mid-term review will allow changes to be made in the Project strategy and activities if there have been problems in achieving objectives. The results of the final review will be widely disseminated to assist others considering a similar project.

I. Implementation Schedule:

Major project events are summarized below. Annex L gives a detailed schedule with responsible parties and timing indicated for each action.

	Activity	Timing
1.	Project Paper Approved	March 88
2.	Project Agreement Signed	June 88
3.	Steering Committee and Project Secretariat Established	July 88
4.	Interim Contractor(s) Mobilized	Aug. 88
5.	DRTPC, TDMS, FEI, Grants Signed	Oct. 88
6.	M/TA RFP Issued	Nov. 88
7.	Full Scale Project Promotion Campaign Started	Dec. 88
8.	Bank Agreements Signed	Jan. 89
9.	Detailed Feasibility Studies of Preselected Applications completed	April 89
10.	First Private Sector Application Funded	June 89
11.	M/TA Contract Awarded	June 89
12.	M/TA Contractor Mobilized	Aug. 89
13.	First Public Sector Application Funded	Sept. 89
14.	Formal Training Program Started	Nov. 89
15.	Data Base Operational	Dec. 90
16.	New Applications Selected	on-going
17.	Mid-point Evaluation	Jan. 92
18.	Second Evaluation	Jan. 96
19.	PACD	Sept. 96

J. Requirements and Covenants:

The Grantee shall agree to cooperate with USAID to accomplish the purpose of the Grant. To this end, it accepts the following requirements and covenants.

1. Requirements Precedent to Disbursement:

a. Requirements to Initial Disbursement:

Prior to any disbursement for this Project, or to the issuance by USAID of documentation pursuant to which disbursement will be made under the Energy Conservation and Efficiency Project, the Cooperating Country will, except as the parties may otherwise agree in writing, furnish to USAID, in form and substance satisfactory to USAID:

- o A statement of the names and titles of the persons authorized as the representatives of the Grantee, together with a specimen signature of each person specified in such statement.
- o Such other documentation as USAID may reasonably require.*

b. Specific to the Public Sector Component:

Prior to any disbursement for this Project, or to the issuance by USAID of documentation pursuant to which disbursement will be made under the Energy Conservation and Efficiency Project for the public sector activities for technology application other than for the interim contractor (s) and technical and management services, the Cooperating Country will, except as the parties may otherwise agree in writing, furnish to USAID, in form and substance satisfactory to USAID:

- o Evidence of establishing a Steering Committee and Project Secretariat including, for the first year, formal designation of members of the Steering Committee and of the Executive Director of the Project Secretariat.
- o Evidence that the Project Secretariat has formulated financial arrangements acceptable to USAID.
- o Such other documentation as USAID may reasonably require.*

* Not to be included in the Project Authorization

c. Specific to the Private Sector Component:

Prior to any disbursment for this Project, or to the issuance by USAID of documentation pursuant to which disbursement will be made under the Energy Conservation and Efficiency Project for the private sector activities for technology application other than those for the interim contractor(s) and technical and management services, the Cooperating Country will, except as the parties may otherwise agree in writing, furnish to USAID, in form and substance satisfactory to USAID:

- o Evidence that the Development Research and Technological Planning Center (DRTPC) has selected a full-time Executive Director for the Project and necessary support staff.

- o An acceptable circular or other official document issued by the MIC, as jointly agreed upon by MIC and USAID, setting forth in necessary and sufficient detail the terms and conditions applicable to grants and loans made under such component.

- o Such other documentation as USAID may reasonably require.*

2. Covenants:

The Cooperating Country agrees that:

a. General:

- o It will provide, on a timely basis, all local logistic support as may be required to ensure effective use of goods and services financed under this grant.

- o The reflows from the public sector loans will be put into a Special Account for the Project, administered by the Steering Committee, and will be used exclusively for meeting Project related requirements. First priority will be given to meeting the operating and technical assistance costs of the Steering Committee, Project Secretariat, and FEI (for public sector activities). Second priority will be given to finance research activities on energy conservation and efficiency.

- o The reflows from the private sector loans will be put into a Special Account for the Project, administered by DRTPC, and will be used exclusively for meeting Project related requirements.

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* Not to be included in the Project Authorization

First priority will be given to meeting the operating and technical assistance costs of the DRTPC and FEI (for private sector activities). Second priority will be given to finance research activities related to energy conservation and efficiency in the private sector.

- The Steering Committee, Project Secretariat, and DRTPC will meet formally with the USAID Project Officer, at least semi-annually, to discuss Project progress.

- The research and management organizations, ministries, authorities, governorates, universities, public sector enterprises, and other public sector agencies involved in the Project will provide the Project Secretariat with all necessary technical and non-technical information, data, reports, and other documents resulting from this Project.*

- The Grantee shall provide to USAID the details of its counterpart contribution on a timely basis.

- Neither AID funds, nor funds derived from the Special Account, nor L.E. generated under this Agreement will be used to pay salary supplements except pursuant to mutually agreeable criteria.*

3. Negotiating Status:

All the above conditions and covenants have been discussed with appropriate Ministry of Industry officials and no problems with their inclusion in the Project Agreement are anticipated.

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