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STAFF APPRAISAL REPORT

ARAB REPUBLIC OF EGYPT

KUREIMAT POWER PROJECT

FEBRUARY 12, 1992

Country Department III
Industry & Energy Operations Division
Europe, Middle East and North Africa Regional Office

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CURRENCY EQUIVALENTS

(as of July 1, 1991)

Currency Unit - Egyptian Pound (LE) = 100 piastres = 1,000 Milliemes
LE 1.0 = US\$0.3
US\$1.0 = LE 3.33

WEIGHTS AND MEASURES

GWh (Gigawatt hour)	= million kilowatt hours
kcal	= kilocalorie (3.97 BTU)
km (kilometer)	= 0.62 miles
kV (kilovolt)	= 1,000 volts
kWh (kilowatt hour)	= 860.42 kcal
m ² (square meter)	= 10.76 square feet
m ³ (cubic meter)	= 35.31 cubic feet
ft ³	= cubic feet
MTOE (million TOE)	= millions tons of oil equivalent
MVA (megavolt-ampere)	= 1,000 kVA
MVAR (megavolt-ampere-reactive)	= 1,000 KVAR
MW (Megawatt)	= 1,000 kW
TOE	= 10.2 million kcal

GLOSSARY OF ABBREVIATIONS

ADB	= African Development Bank
AFESD	= Arab Fund for Economic and Social Development
CIDA	= Canadian International Development Agency
COAC	= Central Organization for Auditing and Control
DRTPC	= Development Research & Technological Planning Center
DSR	= Debt Service Ratio
EDA	= Electricity Distribution Authority
EDC	= Electricity Distribution Company
EEA	= Egyptian Electricity Authority
EGPC	= Egyptian General Petroleum Corporation
EIAR	= Environmental Impact Assessment Report
EMU	= Environmental Management Unit
ERSAP	= Economic Reform and Structural Adjustment Program
ESA	= Egyptian Survey Authority
GDP	= Gross Domestic Product
GEEC	= General Egyptian Electricity Corporation
GOE	= Government of Egypt
HPPEA	= Hydropower Plants Executive Authority
ICB	= International Competitive Bidding
IERR	= Internal Economic Rate of Return
LPG	= Liquefied Petroleum Gas
LRMC	= Long-Run Marginal Cost
MEE	= Ministry of Electricity and Energy
MIS	= Management Information System
MOH	= Ministry of Health
MOP	= Ministry of Petroleum
NPBI	= Net Profit Margin Before Interest
NPM	= Net Profit Margin
OEP	= Organization for Energy Planning
REA	= Rural Electrification Authority
REDA	= Renewable Energy Development Authority
RFA	= Return on Fixed Assets
RNW	= Return on Net Worth
RTA	= Return on Total Assets
SAL	= Structural Adjustment Loan
SEC	= Supreme Energy Council
SFR	= Self-Financing Ratio
SOE	= Statement of Expenditures
TIMS	= Tebbin Institute for Metallurgical Studies
UNDP	= United Nations Development Program
UPS	= Unified Power System
USAID	= U.S. Agency for International Development
USEPA	= U.S. Environmental Protection Agency

FISCAL YEAR

July 1 - June 30

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This report is based on the findings of an appraisal mission to Egypt in July 1991, comprising Messrs. K. Sheorey, Senior Power Engineer (mission leader), J. Maweni (Senior Financial Analyst) and Sherif Arif (Environmental Specialist).

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Map: IBRD No. 23300

STAFF APPRAISAL REPORT

ARAB REPUBLIC OF EGYPT

KUREIMAT POWER PROJECT

LOAN AND PROJECT SUMMARY

- Borrower:** Egyptian Electricity Authority (EEA)
- Guarantor:** Arab Republic of Egypt (Egypt)
- Amount:** US\$220 million
- Terms:** Standard IBRD terms, with 20 years maturity
- Project Objectives:** The proposed project would assist EEA in:
(i) alleviating power shortages; (ii) meeting the growing demand for electricity; (iii) improving the efficiency and reliability of the EEA interconnected system; (iv) strengthening the EEA financial position; and (v) improving the technical and managerial skills of EEA staff.
- Project Description:** The project would consist of: (a) the supply and installation of a dual fuel-fired (fuel oil and natural gas) thermal power station at Kureimat with a net installed capacity of 1,200 MW (two units of net 600 MW each); (b) the supply of material and equipment for about 162 km of a 20-inch diameter natural gas pipeline interconnecting the power station with the gas grid; (c) the supply and installation of about 150 km of 500-kV and about 90 km of 220-kV transmission lines, and line loss reduction equipment of about 500 MVAR capacity; (d) the rehabilitation of Tanta substation; and (e) technical assistance to help EEA with engineering supervision at the power station, providing training (including training equipment) to EEA staff, completion of energy data bank and management information system, computerization of EEA financial (including cost control) management system and introduction of efficient load management system by procurement of special meters for industrial and bulk consumers.
- Benefits and Risks:** Project benefits would include: (i) an increase in the efficiency and reliability of electricity generation, enabling EEA to meet the future electricity demand in Egypt; (ii) an improvement in the reliability of the EEA interconnected system for transmitting electric

power to the load centers; and (iii) an improvement in the operational and managerial skills of EEA staff. There are no major risks associated with the project. Delays in project implementation would have an adverse impact on the rate of return on investment. This risk has been addressed by allowing an eight-year implementation period and the advanced state of project preparation with bidding and evaluation of bids already started on some of the bid packages of the project components.

Estimated Project Cost:

	<u>In Million LE</u>			<u>In Million US\$</u>			<u>Foreign as % of Total</u>
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	
<u>I. Kureirat Power Station</u>							
Base Cost	503.6	2,106.5	2,610.1	152.7	638.3	791.0	81
<u>II. Gas Interconnection (Pipeline)</u>							
Base Cost (Supply of Material and Equipment)	26.6	103.5	130.1	8.1	31.4	39.5	80
<u>III. Transmission Lines</u>							
Base Cost	102.7	235.3	338.0	31.1	71.2	102.3	70
<u>IV. Technical Assistance (incl. Engineering)</u>							
Base Cost	32.2	118.4	150.6	9.7	35.8	45.5	79
Total Project Base Cost (I+II+III+IV)	665.1	2,563.7	3,228.8	201.6	776.7	978.3	79
Physical Contingencies	<u>70.3</u>	<u>251.3</u>	<u>321.6</u>	<u>21.4</u>	<u>76.2</u>	<u>97.6</u>	<u>78</u>
Subtotal	735.4	2,815.0	3,550.4	223.0	852.9	1,075.9	79
Price Contingencies	<u>508.6</u>	<u>1,960.9</u>	<u>2,469.5</u>	<u>37.8</u>	<u>147.2</u>	<u>185.0</u>	<u>80</u>
TOTAL PROJECT COST (I+II+III+IV)	1,244.0	4,775.9	6,019.9	260.8	1,000.1	1,260.9	79
<u>V. Reserved Procurement (Gas Pipeline Erection)</u>	28.6	0.0	28.6	6.0	0.0	6.0	0
<u>VI. Interest During Construction</u>							
Bank Financed Components	0.0	152.8	152.8	0.0	32.5	32.5	100
Others	<u>0.0</u>	<u>471.2</u>	<u>471.2</u>	<u>0.0</u>	<u>86.8</u>	<u>86.8</u>	<u>100</u>
TOTAL VI	0.0	624.0	624.0	0.0	119.3	119.3	100
TOTAL FINANCING REQUIRED (I+II+III+IV+V+VI)	1,272.6	5,399.9	6,672.5	266.8	1,119.4	1,386.2	81

Financing Plan:

(in US\$ Million)

<u>Funding Agency</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>% of Financing Plan</u>
1. IBRD	-	220.0	220.0	16
2. ADB	-	350.0	350.0	25
3. AFESD	-	125.0	125.0	9
4. USAID	-	193.8	193.8	14
5. Saudi Arabia	-	50.0	50.0	4
6. EEA/EGPC	<u>266.8</u>	<u>180.6</u>	<u>447.4</u>	<u>32</u>
TOTAL	266.8	1,119.4	1,386.2	100

Estimated Project

Completion Date: June 30, 1997

Estimated Disbursement:

	<u>IBRD Fiscal Year</u>							
	(in US\$ Million)							
	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>
During the Year	0.0	10.5	27.8	53.0	67.0	35.8	19.2	6.7
Cumulative	0.0	10.5	38.3	91.3	158.3	194.1	213.3	220.0

Economic Rate of Return: 10 percent

Map: IBRD No. 23300

STAFF APPRAISAL REPORT

ARAB REPUBLIC OF EGYPT

KUREIMAT POWER PROJECT

I. ENERGY SECTOR

A. Sector Background

1.01 The Arab Republic of Egypt (Egypt) has the largest population and second largest economy (after Saudi Arabia) in the Middle East. In the decade 1974-1984/85 (FY85), the real GDP grew rapidly by about 9 percent per annum, stimulated by an extraordinary increase in foreign exchange earnings from oil exports, workers' remittances, Suez canal fees, tourist receipts and foreign aid. However, a pervasive system of pricing controls and heavy import protection created growing distortions, resulting in the inefficient use and allocation of resources.

1.02 Thus, by the early 1980s the economy, which became heavily dependent on oil exports and workers' remittances, was not prepared to handle the consequences of lower oil prices, declining workers' remittances, and slower growth in Suez canal and tourism revenues. In spite of declining foreign exchange earnings, during FY83-85, overall economic growth was maintained at 6-7 percent at the cost of rapidly worsening balance of payment deficits and a sharp increase in foreign debt.

1.03 Since FY86, the accumulation of distortions, inefficiencies and imbalances led to a slow and unsustainable economic growth, and unmanageable external debt. Based on the agreement reached with the IMF in 1987 regarding measures to be taken by the Government, the IMF agreed in 1987 for a Stand-by and the Paris Club rescheduled its debt. While IMF Stand-by and the Paris Club debt rescheduling in 1987 provided some temporary relief, the measures taken by the Government in structural reforms were inadequate and the real GDP growth rate further declined from 2.5 percent in FY89 to about 2 percent in FY91 and is expected to be about 1 percent in FY92.

1.04 To stem the decline in the GDP growth rate and to stimulate growth, the Government has recently embarked on an ambitious Economic Reform and Structural Adjustment Program (ERSAP). Energy pricing reforms is an important component of ERSAP. The Government has agreed to bring the energy prices to economic level by FY95. In support of the ERSAP, an IMF Stand-by facility was approved by the Fund Board in May 1991 and a Structural Adjustment Loan was approved by the Board in June 1991. With the implementation of the agreed measures, the real GDP growth rate is estimated to improve from about 1 percent in FY92 to 4 percent in FY94. Thereafter, the GDP growth rate of 4 percent is likely to be sustained till the end of the century.

1.05 The energy sector plays an important role in Egypt's economy. Egypt's balance of payments is heavily dependent on petroleum¹. Not only is petroleum the largest single earner of foreign exchange, other major sources -- worker's remittances, Suez canal traffic and even tourism -- are closely related to the conditions in the world oil markets. Petroleum-related exports accounted for about two-thirds of merchandise exports in the 1980s; since then, they have fallen to below 50 percent due to decline in both volume and prices. As Egypt's oil production is expected to begin its decline in the mid-1990s and domestic consumption of petroleum increases, the country may become a net importer of petroleum oil before the end of the decade. Egypt will therefore have to stimulate rapid growth of non-oil exports. The most dynamic export performance is expected from non-textile manufactured goods which are projected to grow by about 9 percent annually in constant terms. The projected rapid growth of manufacturing exports would, in turn, require an appropriate growth in the infrastructure required for the manufacturing sector. Adequate and reliable supply of electricity is an essential requirement for sustaining the projected growth in the manufacturing sector.

B. Energy Resources

1.06 Egypt has proven resources of oil, gas, hydropower and to some extent coal. As of FY88, proven oil and natural gas reserves were about 480 million mt and 12 trillion ft³ of gas respectively. Egypt depends heavily on the river Nile for its hydropower resources. Egypt's hydropower potential is about 12,000 CWh per annum out of which about 9,500 GWh has been harnessed with the completion of High dam and Aswan I and Aswan II power stations. The harnessed hydropower potential would increase from 9,500 GWh to 9,900 GWh with the completion of the New Esna Barrage Power Project in FY94. The balance potential of 2,100 GWh is in small hydro projects on the Nile river and the Government is studying the techno-economic feasibility of tapping the potential. The other possible hydropower potential (about 10,000 GWh) is the Qattara depression which is about 135 m below the Mediterranean sea level and advantage could be taken of the difference in levels for hydropower generation. The prohibitive cost of 160 km canal through the desert to take advantage of the difference in level for power generation and the ecological impact it could have, makes it unattractive for utilization of the potential for power generation. The only coal mining project under consideration is the Maghara coal mines in Sinai. It is estimated that about 27 million mt of minable coal is available out of which about 21 million mt is recoverable. However, currently, only about 3 million mt could be classified as proven coal reserves.

1.07 Egypt has abundant solar radiation, the annual average of direct solar radiation varying between 6 to 8 kWh/m²/day. Except under special circumstances, the high cost of the technology for utilization of the solar

¹/ Petroleum, a generic term, includes oil and oil products in all forms such as crude oil, lease condensate, unfinished oils, petroleum products, natural gas plant liquids and nonhydrocarbon compounds blended into finished petroleum products.

energy prevents its commercial exploitation for power generation. The possibility of utilizing the solar energy for water heating is more attractive and the Government is encouraging the development and standardization of the solar water heaters. The potential for utilization of wind power for power generation and water pumping exists in the Mersa Matruh region on the Mediterranean coast and the Hurgada region on the Red sea where wind speeds of more than 20 km/hour have been recorded. The Renewable Energy Development Authority (REDA) under the Ministry of Electricity and Energy (MEE) is establishing pilot projects for development of solar and wind power in Egypt. Even though some sites with possible geothermal potential have been identified in the country, the low temperatures of the sources (48°C to 78°C) limits their application for power generation. Egypt is not well endowed with biomass, however, the use of biogas digester could be considered in rural areas where the gas produced in digester could be used for domestic purposes and the residue could be used as a source of soil nutrient.

C. Energy Supply and Demand

1.08 Today, Egypt exports energy, however, beyond the year 2000, it may have to resort to energy imports. Figure 1.1 is based on the data in Annex 1.1 which gives the actual (FY82-91) and estimated (FY92-99) supply, export and demand for energy in Egypt. During FY82-91, production of commercial energy, comprising petroleum, natural gas and hydropower, grew by about 4 percent annually from about 40.6 MTOE to 58.0 MTOE. During the same period, domestic consumption of energy grew at a higher rate of about 6 percent annually from about 18.0 MTOE to 30.9 MTOE and the energy exports¹ (of crude oil and petroleum products) grew annually at a lower rate of about 2 percent from about 20.3 MTOE to 24.8 MTOE. In the absence of any substantial new discoveries, it is estimated that petroleum production would reach its peak around FY93-94 and over a longer term (beyond the year 2000), Egypt could become a net importer of energy. Figure 1.1 also gives the energy consumed in the power subsector. The subsector accounts for about 40 percent of the total domestic energy consumption. During the period FY82-91, the energy consumption of the subsector increased at a rate of about 5 percent annually from about 7.2 MTOE to 10.9 MTOE. Given the declining production of petroleum and natural gas, limited hydropower potential that could be economically tapped, and increasing demand for energy, it is essential that the Government encourages efficient use of energy through pricing of energy at economic level and implementation of energy conservation measures by the energy users.

1.09 Apparently, no clear relationship exists between the annual GDP growth rates and growth rates of domestic energy consumption or those for the electricity consumption by the end users. One possible reason for this situation could be wrong signals given to the country's economy by the low energy prices compared to their economic values. Figure 1.2 below gives the actual (FY82-91) and estimated (FY92-99) growth rates for GDP, energy consumption and electricity consumption. During the period FY82-91, GDP

1/ Petroleum exports includes exports by the Government and those by the partners assisting the Government in production of crude oil.

growth rate slid from about 11 percent in FY82 to 2 percent in FY91 in three stages. GDP growth rate went down from 11 percent in FY82 to 6 percent in FY84 and after hovering around 6 percent during FY84-85, it again continued the slide and was 2.5 percent in FY87. After a short upward move to 4 percent in FY88, the GDP growth rate slid again to 2 percent in FY91 and is estimated to be 1 percent in FY92.

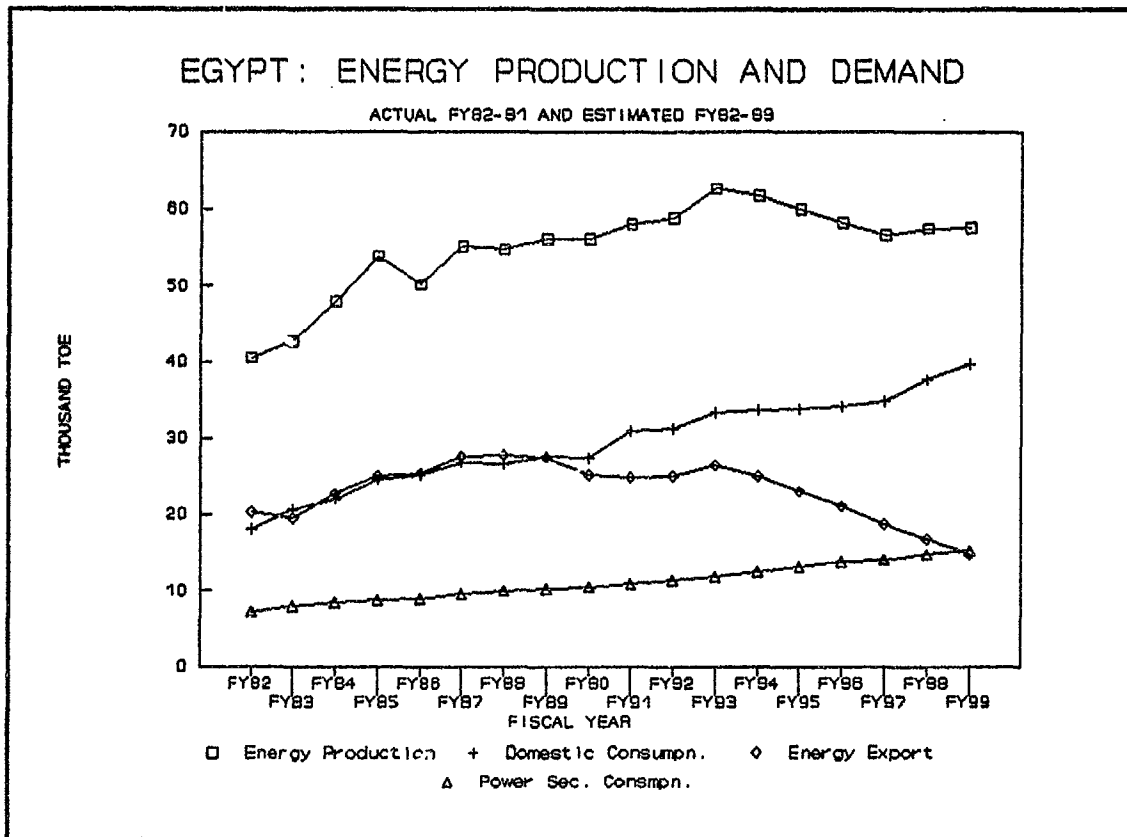


Figure 1.1

There appears to be a time lag of about one to three years in the downward movement of the growth rate of energy consumption. Thus, after attaining a peak of about 14 percent in FY83, the growth rate for energy consumption dropped to about 2 percent in FY86 and after reaching a smaller peak of about 8 percent in FY87, it continued its downward trend till it was about minus 0.5 percent in FY90. Thereafter, while the GDP growth rate is expected to reach its lowest (1 percent) in FY92, the growth rate for energy consumption, after a series of wide fluctuations during FY91-94, is expected to reach its lowest (about 0 percent) in FY95. The growth rate of the electricity consumption by the end users appears to be the slowest to respond to the changes in the GDP growth rates. After attaining a peak of about 15 percent in FY84, the growth rate for electricity consumption slid to about 7 percent in FY85 and rose to a smaller peak of 10 percent in FY86 before continuing its gradual decline to about 5.2 percent in FY91. During the period FY92-99 the

annual growth rate for electricity consumption is expected to be about 5 percent¹.

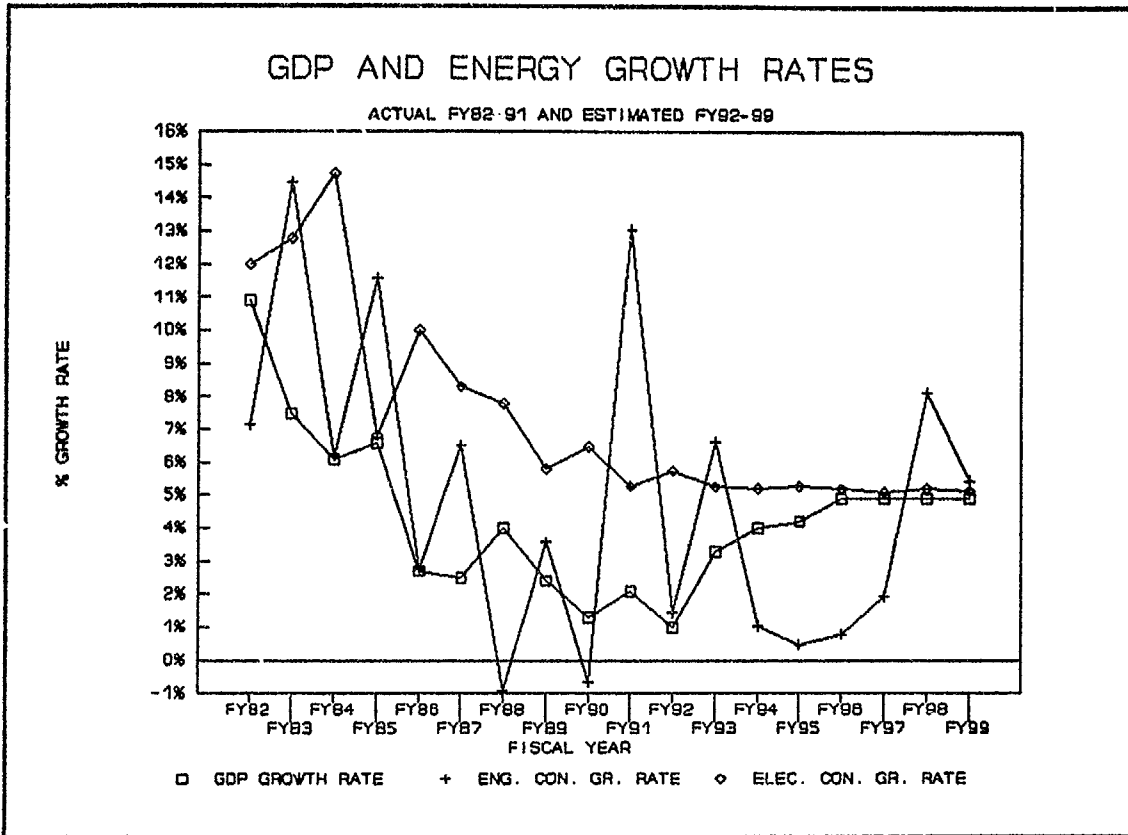


Figure 1.2

D. Energy Prices

1.10 Table 1.1 below gives the history, for FY83-91, of: domestic petroleum prices in current LE/mt; natural gas prices in current LE/mt of fuel oil equivalent; and weighted average electricity tariffs for the end users in current mills/kWh.

¹/ Based on the GDP growth rate and other macroeconomic indicators projected under the Structural Adjustment Loan to Egypt, the appraisal mission revised the forecast for FY92-99 for electricity consumption by the end users.

Table 1.1: HISTORY OF ENERGY PRICES IN CURRENT TERMS

Item	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91
1. Gasoline (80 Octane)	154.0	154.0	210.0	280.0	350.0	490.0	490.0	770.0	980.0
2. Gas Oil 1/	36.0	36.0	36.0	36.0	60.0	60.0	84.0	120.0	240.0
3. Kerosene 1/	36.0	36.0	36.0	37.8	63.0	60.0	88.2	126.0	252.0
4. Fuel Oil (High Sulphur)	7.5	7.9	12.4	17.6	28.0	28.0	35.0	50.0	80.0
5. LPG	52.0	52.0	52.0	52.0	52.0	52.0	52.0	120.0	200.0
6. Natural Gas (Bulk)	7.6	8.0	12.5	19.6	30.3	33.0	42.5	60.1	96.5
7. Electricity (mills/kwh) 2/1	2.4	14.5	16.9	22.6	24.3	30.0	33.7	43.4	82.5
8. Av. Exchange Rate LE/\$	1.13	1.18	1.38	1.74	2.17	2.28	2.38	2.65	3.30

Notes:

1/ The Government increased, as of January 4, 1992, the prices of gas oil and kerosene by 50 percent to LE 360/mt and LE 378/mt respectively.

2/ Electricity prices for FY83-89 are the weighted average tariffs applicable to the end users. For FY90-91, however, the columns "FY90" and "FY91" take into account the May 1990 and May 1991 exchange rates and price increases in the petroleum, natural gas, and electricity prices announced by the Government. Actual increase in revenue on account of these increases would basically accrue in FY91 and FY92.

1.11 Despite recent substantial energy price increases (para. 1.12) the energy prices in Egypt are below the economic levels. Historically, the conception of abundance of petroleum, natural gas and hydropower allowed the Government to maintain domestic energy prices below the economic levels. The low energy prices gave wrong signals to the consumers and resulted in the: (i) inefficient use of energy by the end users; (ii) high energy growth rates, depletion of domestic energy resource base and diminished export capacity; (iii) establishment of energy intensive industries such as Nag Hammadi aluminum plant and Kima Fertilizer plant which uses electrolysis process instead of natural gas for ammonia production; (iv) lack of incentive for adoption of energy conservation measures in industry; (v) inefficient resource allocation and sub-optimal growth of GDP; and (vi) increase in environmental pollution. In addition, high consumption of non-renewable domestic energy resources may make the country a net importer of energy beyond the year 2000 (para. 1.08).

1.12 Since 1980, the Bank was involved in a dialogue with the Government regarding the issue of energy price increases. The Government decided to take steps to correct the situation and during FY84-91, the weighted average electricity tariff was increased by about 470 percent in current terms. During the same period, the Government increased the prices (in current terms) of natural gas, fuel oil, kerosene, gas oil, gasoline and LPG by 1,106 percent, 913 percent, 600 percent, 567 percent, 536 percent and 285 percent, respectively. As a result of the understanding reached under the SAL and the IMF Stand-by agreements, and the May 1991 increases of energy prices, the weighted average tariff for electricity was about 59 percent of the average tariff based on long-run marginal cost (LRMC) and the weighted average petroleum product price (including bulk natural gas sales) was about 56 percent of internationally traded equivalent. Effective January 4, 1992, the Government increased the prices of gas oil and kerosene by about 50 percent. As a result, based on the current exchange rate of LE 3.33/US\$, the weighted average petroleum price in Egypt is 64 percent of the internationally traded equivalent thus exceeding the agreed target of 56 percent by December 1991. Annex 1.2 gives the definition of internationally traded equivalent

(twelve months rolling average of petroleum product prices) as agreed by the Government during SAL negotiations. Based on this formula, the Government intends, by June 1995, to adjust the weighted average domestic prices of petroleum products and natural gas¹ to their internationally traded equivalents, and electricity prices to cover LRMC cost. For petroleum products, the Government intends to adjust nominal petroleum prices by June 1992, to reach the 67 percent target of international prices. Further, the Government agreed that the weighted average price as a percentage of international equivalents will be increased an additional 11 percentage points by May of each following year (1992 - 1995, inclusive). The price increase applied to bulk natural gas supply will be equivalent to that for domestic fuel oil prices. For electricity prices, the Government agreed that the weighted average price as a percentage of LRMC will be increased by about 10 percentage points at least annually to move the prices already announced for May 1991 (59 percent of LRMC) to 100 percent by June 1995. The basis for LRMC prices is explained in para. 2.07 and Table B, Annex 2.3.

E. Issues in Energy Sector

1.13 The main issues in the energy sector are: (i) energy pricing; (ii) financial health of the petroleum and power subsector institutions; (iii) need for energy conservation; (iv) improvement of operational efficiency; (v) reduction of line losses; and (vi) introduction of load management techniques. Actions to resolve these issues are ongoing under the SAL, the Bank-financed Fourth Power Project and under the bilateral programs. The issue of energy pricing is being addressed under the SAL. Resolution of this issue will in turn help to solve the problem of weak financial performance in the power and petroleum subsectors (para. 1.14) and will also induce energy users to focus their attention on energy conservation (para. 1.15). The proposed project would provide technical assistance to improve EEA operational efficiency through: implementation of effective cost control systems; procurement of line loss reduction equipment; and rehabilitation of equipment in the EEA electrical network (paras. 1.14 and 1.16). In addition, assistance to reduce line losses is also being pursued under the bilateral programs (para. 1.16).

1.14 Implementation of the agreed (para. 1.12) increases in petroleum products and electricity prices would assist the petroleum and the power subsector institutions in improving their financial health. Performance of the petroleum subsector institutions depends primarily on two factors: international and domestic energy prices. Declining oil prices and low domestic prices compounded by the anticipated decline in oil production levels and rising cost of gas supply has affected the financial health of the Egyptian General Petroleum Corporation (EGPC). The Gas Investment Project

1/ Natural gas is expected to be supply-constrained for the medium and possibly long term, largely due to substantial demand for power plants and heavy industries. Any marginal change in natural gas availability would impact fuel oil consumption. Therefore, the Government has agreed to tie the price of natural gas supplied to bulk consumers to the fuel oil equivalent.

approved by the Board in June 1991 would address some of the issues related to the petroleum subsector. Increasing the electricity prices to match LRMC costs would assist the power subsector institutions in improving their financial performance. However, to ensure compliance with the financial covenants¹ under the ongoing Fourth Power Project and to minimize the future tariff increases, EEA would have to take measures such as minimizing operating expenditures, reducing system losses, delaying investments by ensuring maximum utilization of existing generating capacity and introducing effective cost control system. Agreement has been reached with EEA that the technical assistance component of the project should include assistance in implementing a computerized cost accounting system and training of its staff in cost analysis and preparation of management reports (paras. 5.02 and 5.24).

1.15 The Government intention of increasing energy prices to economic levels by FY95 and the fact that, in future, Egypt is likely to be a net importer of energy (para. 1.08), would focus the attention of the institutions in the energy sector and the end users of energy to the importance of energy conservation and efficient utilization of energy. The Government has already established by Decree Number 112 of 1983 the Organization for Energy Planning (OEP) to develop and implement energy programs that lead to rational energy resource utilization in residential, commercial, transportation and industrial sectors. However, OEP has not yet become effective due to lack of inter-sector discipline and coordination. To promote energy conservation in the industrial sector, the Government established an Industrial Energy Conservation Center within the framework of Tebbin Institute for Metallurgical Studies (TIMS). The center under TIMS generally caters for energy conservation and efficiency improvement measures for the public sector industries while the Development Research and Technological Planning Center (DRTPC) established in the Cairo University caters for similar measures to be taken in the private sector industries.

1.16 To minimize the operating expenditures (para. 1.14), EEA would have to improve its operational efficiency, reduce line losses, ensure maximum availability of its installed generating capacity and implement effective load management systems. The Government of Finland and the U.S. Agency for International Assistance (USAID) are assisting EEA and the Electricity Distribution Authority (EDA) in their efforts for reduction of line losses in their electrical systems. The ongoing Fourth Power Project has provided technical assistance to assist EEA in load management techniques which were initiated under the technical assistance funded by the Bank under the Shoubrah El Kheima and the Third Power Projects. The proposed project provides funding for procurement of special meters for bulk and major industrial consumers, installation of transmission lines, procurement of line loss reduction equipment and Tanta substation rehabilitation to enable EEA to improve the efficiency and reliability of its electrical system.

1/ The financial covenants require EEA to achieve self financing ratios of 20% in FY92, 30% in FY93, and 35% from FY94 onwards. In addition, EEA should achieve every year a debt service ratio of 1.5.

F. Energy Sector Institutions

1.17 The Ministry of Petroleum and Mineral Resources (MOP) and the Ministry of Electricity and Energy (MEE) are responsible for Egypt's energy sector. In addition, OEP was established in 1983 (para. 1.15) to develop and implement energy programs that lead to rational energy utilization. OEP is an autonomous organization under the Supreme Energy Council (SEC) which includes all Cabinet Ministers concerned with production and consumption of Energy.

1.18 In the petroleum subsector, the Government-owned EGPC functions as a holding company under the control of MOP. The primary responsibility for all exploration, production, refining and transportation of petroleum and natural gas rests with EGPC which carries out these functions through its subsidiaries. Some of these subsidiaries have partnerships in oil production with foreign companies. The marketing and distribution of oil and gas is largely carried out by EGPC and its subsidiaries, but private companies are involved in distribution of gasoline and LPG.

1.19 Annex 1.3 gives the organization chart for Egypt's power subsector. MEE oversees the power subsector through: (i) the Egyptian Electricity Authority (EEA), a publicly-owned enterprise responsible for almost all the power generated and transmitted in Egypt; (ii) the Electricity Distribution Authority (EDA) which coordinates the distribution activities of eight regional Electricity Distribution Companies (EDCs) responsible for distribution of electricity to medium and low voltage consumers; (iii) the Hydropower Plants Executive Authority (HPPEA) responsible for construction of new hydropower projects in coordination with the Ministry of Irrigation; (iv) the Rural Electrification Authority (REA) responsible for construction of distribution networks in urban and rural areas; (v) the Nuclear Power Plants Authority, Atomic Power Authority and Nuclear Material Authority responsible for planning construction and operation of nuclear plants; (vi) the Renewable Energy Development Authority (REDA) responsible for introduction of the renewable energy projects in the country; and (vii) the Organization for Construction and Manufacture of Electrical Equipment which is involved through its four affiliates in manufacture of electrical equipment and providing support for the construction activities concerning transmission and distribution lines.

G. Poverty Impact Minimization

1.20 Power projects are not the means to directly combat poverty. However, an adequate supply of electricity is an important prerequisite for the development of competitive industrial, commercial and trade structures. The power projects, therefore, are an essential tool for promotion of economic growth in the developing countries. Improved economic conditions in the country would assist the Government's objective of improving living conditions for the poor. Further, the Government intends to maintain a lower level of tariffs for the average domestic consumer and small commercial consumer using about 100 kWh of electricity per month (para. 2.07).

II. POWER SUBSECTOR

A. Background

2.01 EEA is responsible for generation and transmission of almost all the electricity in Egypt. It also distributes electricity directly to: (a) eight major industrial consumers at 220-kV/132-kV; (b) fourteen industrial and two agricultural consumers at 66-kV; and (c) five industrial and two agricultural consumers at 11-kV. EEA through its eight EDCs is responsible for bulk purchase of power from EEA for distribution of electricity to medium and low voltage consumers.

2.02 Except for about one percent of EEA installed generation capacity characterized by isolated islands of power generation and transmission, EEA installed generation capacity is connected to the Unified Power System (UPS). Hydropower generation at Aswan (High Dam, Aswan I and II) is transmitted to the major load centers in the Cairo region at 500 kV. Most of the thermal power generation (including combustion turbines and combined cycle plants) located in Lower Egypt is transmitted to the load centers at 220 kV. Except for 500-kV transmission from Aswan to Cairo, power transmission in Upper Egypt is at 132 kV. Due to increase in power demand in Upper Egypt, EEA is planning to install 220-kV transmission lines in Upper Egypt.

2.03 EDCs purchase power in bulk, at 66-kV and 33-kV, from EEA at 772 points of supply. EDCs, normally, step down the power purchased from EEA to 11-kV for distribution of electricity.

B. Electricity Supply and Demand

2.04 Annex 2.1 gives EEA generation and sales data: actual for FY82-91 and estimated for FY92-99. The isolated system hardly accounts for one percent of EEA generation and sales, and after FY96 its size would be reduced as more and more areas would be connected to UPS in future. The following paragraphs would, therefore, concentrate on the analysis of the UPS. Figure 2.1 below gives the installed capacity and demand of UPS from FY82-99. Hydropower dominated UPS installed generation capacity till FY84 when the installed thermal generating capacity overtook that of the hydropower capacity. With the expectation of availability of natural gas, EEA installed combustion turbines till FY87 and later took advantage of more efficient combined cycle plant which normally requires assured supply of natural gas or diesel oil. Except for start-up and emergency operations, it is uneconomical to use diesel oil (gas oil) for a combined cycle plant which normally would be used as a base load plant. In FY90, the installed capacity of the combustion turbines and combined cycle plants exceeded the hydropower capacity. However, with the restricted availability of natural gas in future and after completion of the ongoing combined cycle plants by FY95, the new generation capacity to be installed would most likely be dual-fuel fired (natural gas and fuel oil) thermal power plants. If availability of adequate natural gas to comply with the environmental standards cannot be assured for the dual fuel fired power plants, power plants using other fuels such as coal may have to be considered in future. Annex 2.2 gives details of EEA existing (FY82-91) and estimated

(FY92-99) installed generation capacity by type after taking into account the retirement (about 750 MW) of the old plants. It is seen that during FY82-91, EEA installed generation capacity in the UPS grew annually by about 10 percent and is estimated to grow annually by about 4 percent during FY92-99. The lower growth rate for FY92-99 is due to the anticipated macroeconomic situation during the period and the proposed energy price increases which would bring the energy prices to their economic levels by FY95. The existing installed generation capacity in UPS system is 11,707 MW, of which about 50 percent is in thermal steam, 26 percent in combustion turbines/combined cycle and 24 percent in hydropower plants. By FY99, the installed generation capacity would be 15,678 MW, of which about 62 percent would be in thermal steam, 20 percent in combustion turbines/combined cycle and 18 percent in hydropower plants. Thus during FY92-99, thermal steam plants would increase their share of installed capacity from 50 percent to 62 percent while the share of combustion turbines/combined cycle and hydropower plants in the installed capacity would decline during the same period.

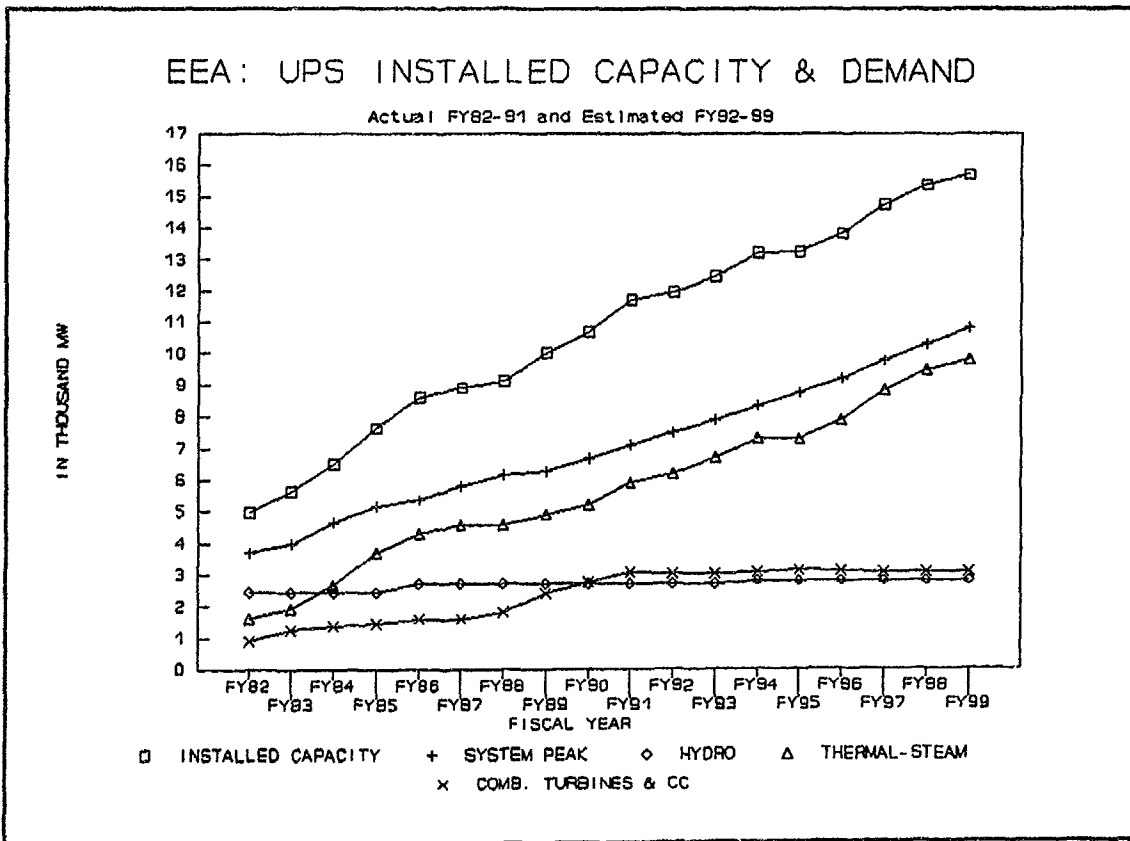


Figure 2.1

2.05 Figure 2.2 below gives the units generated by type -- thermal steam, combustion turbines (including combined cycle) and hydro -- in the UPS system. It is seen that, from FY83 onwards, generation from thermal plants exceeded that from the hydropower plants. For the period FY82-90, which has also seen the seven-years drought in the region, the average annual generation

from hydropower plants was about 9,500 GWh. For the same period, generation from the combustion turbines/combined cycle plants was lower than the hydropower plants due to lower natural gas availability. With the increased availability of natural gas, the generation from the combustion turbine/combined cycle plants is estimated to exceed the generation from hydropower plants from FY93 before levelling off from FY95 onwards due to restricted availability of natural gas (para. 2.04). In FY91, the UPS generation was about 43,888 GWh, of which about 70 percent was from thermal steam, 22 percent from hydropower and 8 percent from combustion turbines plants. In FY99 the UPS generation is estimated to be about 64,324 GWh, of which about 58 percent would be from thermal steam, 27 percent from combustion turbines and combined cycle, and 15 percent from hydropower plants. Thus, during FY92-99, the share of generation from thermal and hydropower plants would decrease while the share of generation from the combustion turbines/combined cycle power plants would increase substantially.

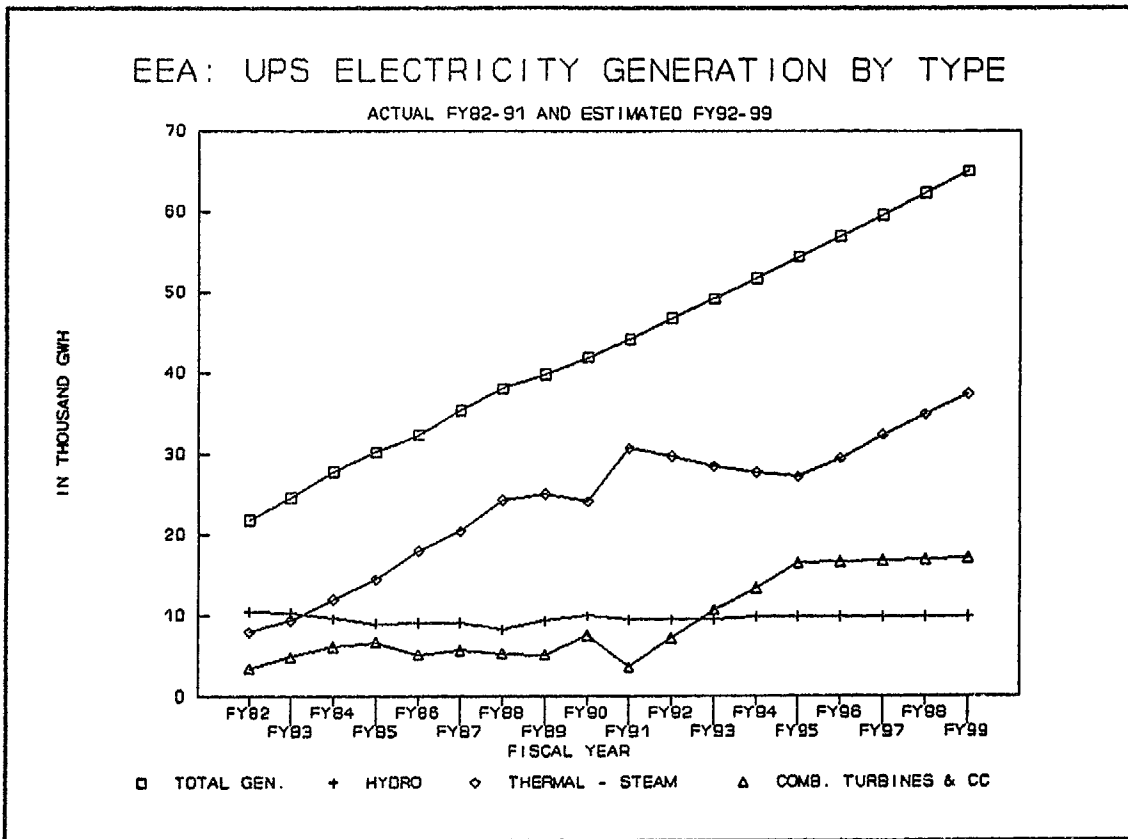


Figure 2.2

2.06 Figure 2.3 below is based on the data in Annex 2.1 and gives electricity sales (actual for FY82-91 and estimated for FY92-99) to the end consumers. In addition to EDA selling electricity to the end consumers, EEA also sells directly to some of the major industrial and agricultural consumers (para. 2.01). Thus, electricity sales to the end consumers are those from EDA and EEA. During FY82-91, total electricity sales to the end consumers more

than doubled and grew at about 9 percent. During FY92-99, the electricity sales to the end consumers are estimated¹ to grow annually at about 5 percent.

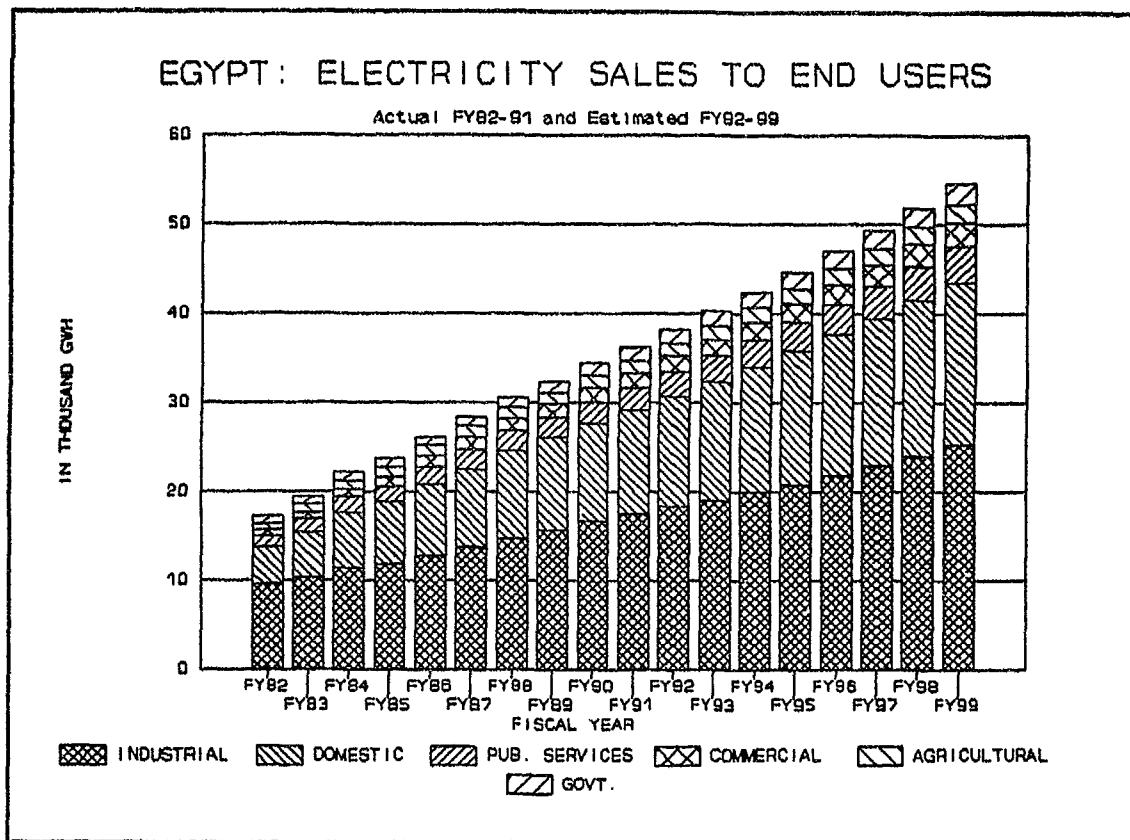


Figure 2.3

In FY91, electricity sales to the end consumers were about 36,287 GWh, of which about 48 percent were to the industrial consumers, 32 percent to the domestic consumers, 7 percent to the common public services and the balance of 13 percent to other consumers. In FY99, electricity sales to the end consumers are estimated to be 54,571 GWh, of which 46 percent would be to the industrial consumers, 33 percent to the domestic consumers, 7 percent to the common public services and the balance of 14 percent to other consumers. Therefore, it is seen that the pattern of electricity consumption by consumer categories does not change much during the period of 8 years. There appears to be no direct relationship between GDP growth rates and growth rates of electricity sales to the end consumers (Figure 1.2). One of the reasons could

^{1/} Based on the GDP growth rates and other macroeconomic indicators projected under the Structural Adjustment Loan to Egypt, the appraisal mission reviewed with EEA and revised the forecast for electricity sales to the end consumers for FY92-99.

be wrong signal (para. 1.09) given to the end users due to the low electricity tariffs which do not reflect its economic value.

C. Electricity Pricing

2.07 Weighted average electricity price charged to the end users is below the LRMC based costs (para. 1.12 and Table 1.1). During FY83-87 weighted average electricity price doubled in current terms and with the latest tariff increases (May 1991), the weighted average electricity prices nearly trebled during FY88-91. Table A, Annex 2.3 (page 1 of 2) gives weighted average electricity tariffs for major groups of end users, and weighted average tariffs for EEA and EDA. Table B, Annex 2.3 (page 1 of 2), gives the breakdown for the LRMC cost of 4.31 US Cents/kWh assumed during negotiations for SAL. The table also gives LRMC projections for FY92-99. Annex 2.3 (page 2 of 2) gives in detail the electricity tariff rates and increases implemented for important groups of end users and includes the effect of May 1991 increases on these end users. The Government intends to increase, by FY95, the weighted average electricity tariffs to reflect the LRMC costs. However, for rationalizing the future tariff increases, EEA is carrying out a tariff study financed by USAID. The report is scheduled for June 1992. The Government would review the report and take into account the recommendations of the report while carrying out the future tariff increases. The Government intends to maintain a lower level of tariff for the average domestic consumer and small commercial consumer using 100 kWh of electricity per month compared to consumers falling into higher levels of electricity consumptions. Thus, for domestic and commercial consumers using 4,000 kWh or more of electricity per month, the electricity tariff is 5 to 6 times that of consumers using 100 kWh/month or less.

2.08 Increasing the electricity prices to match LRMC costs would assist EEA and EDA to improve their financial performance (para. 1.14). However, to keep the future tariff increases to the minimum, EEA and EDA need to take measures to reduce system losses. Reduction of losses in their transmission and distribution systems is an essential step in this direction. EEA and EDA are aware of the issue (para. 1.16). EEA, with the assistance from the Government of Finland, carried out a study in 1983 for reactive compensation required to reduce line losses in its system and based on the recommendations in the study, EEA is procuring capacitors of about 900 MVAR total capacity under bilateral credit from Finland. The first phase of installation of capacitors of about 400 MVAR capacity was completed in 1987 and the second phase comprising installation of capacitors of about 500 MVAR capacity is scheduled for completion in 1992. To achieve its objective of reduction of line losses, EEA needs to install additional capacitors of about 500 MVAR capacity (a component of the project). EEA line losses (Annex 2.1, Page 2 of 2) which stood at about 10 percent in FY82 were brought down to 7 percent in FY91 and are estimated to be reduced to about 5.5 percent by FY99. USAID has assisted EDA in its efforts to reduce line losses in its system. It provided funding for rehabilitation of urban distribution systems and is providing expert assistance for EDA efforts to reduce line losses. Line losses in the EDA systems, which stood at about 13 percent in FY82, were reduced to 11 percent in FY91 and are estimated to be reduced to less than 9 percent by

FY99. The total (EEA plus EDA) line losses were reduced from about 19 percent in FY82 to less than 15 percent in FY90 and are estimated to be reduced to about 12 percent by FY99.

D. EEA Investment Plan

2.09 Annex 2.4 gives the revised EEA least-cost investment plan for FY92-99 which amounts to about LE 36,766 million out of which LE 30,282 million (about 82 percent) is in foreign exchange. About 74 percent of the plan investment is in generation, 24 percent is in transmission and the balance of 2 percent is for training and other miscellaneous items. The scheduling of new power stations or extension to the existing power stations depends on the load forecast and the available capacity of the existing power stations. The investment plan takes into account replacement required for retirement of about 750 MW of total capacity.

2.10 The Government has a long-term goal of regional exchange of power between Arab and African countries through interconnection of electrical systems of the countries. The feasibility study for interconnecting the electrical systems of Egypt and Jordan has been completed. Further, the consultants, Canadian Interconnection Consortium, are carrying out the feasibility study for interconnection of the electrical systems of Egypt, Iraq, Jordan, Syria and Turkey. Political stability in the region would be one of the important factors if full economic benefits from such interconnections are to be realized.

E. Issues in Power Subsector

2.11 The main issues in the power subsector are: (i) low electricity tariffs which do not cover LRMC costs; (ii) high line losses; (iii) financial health of EEA; (iv) lack of effective cost analysis, control and monitoring; (v) inadequate computerization of EEA accounts; and (vi) lack of effective management information system (MIS) and inter-departmental coordination within EEA. The issues (i), (ii) and (iii) have been covered in paras. 1.13 through 1.16, Section I and para. 2.08; therefore, the remaining issues (iv) through (vi) are discussed in the following paragraphs.

2.12 With implementation of energy price increases agreed under the SAL, the EEA financial viability would improve. However, to minimize the risk of not achieving the financial targets under the covenants under the ongoing Fourth Power Project and to minimize the future tariff increases, additional efforts by EEA are required to minimize operating expenses and improve its operational efficiency. To minimize expenses, effective cost analysis, control and monitoring of elements of cost of production and supply of electricity is essential. The proposed project would provide technical assistance for training EEA staff in cost analysis and preparation of management reports so as to improve cost control (para. 5.02). To improve liquidity, EEA needs to make special efforts to improve collection of accounts receivable. As of June 30, 1991, EEA accounts receivable represented about 5.6 months of average electricity sales (para. 5.13) and are to be reduced, by June 30, 1992, to 3 months of electricity sales. Thereafter, at any point in

time, EEA accounts receivable would be maintained within the limit of 3 months according to the financial covenants under the Fourth Power Project. With the agreed tariff increases in future, the situation is likely to worsen unless EEA makes special efforts to maintain its accounts receivables within the limit of 3 months.

2.13 EEA has installed modern office equipment and has access to modern office technology; however, except in limited areas of technical power system analysis, it has not taken full advantage of the available equipment. Computerization of the financial and cost accounting systems has been initiated but is incomplete and inadequate (para. 5.01).

2.14 EEA has the basic requisites for introduction of MIS. However, lack of interdepartmental coordination and effective system for collection of data has delayed the implementation of the MIS system. In the absence of coordination between its technical and financial departments, especially in planning matters, it is not able to make effective use of MIS system (hardware and software) installed under Project EGY/81/037 funded by the United Nations Development Program (UNDP). The proposed project provides additional technical assistance to assist EEA in implementing MIS.

F. Role of IDA/Bank in the Power Subsector

2.15 The World Bank group has been involved in ten operations in the energy sector, of which five operations are in the power subsector. The operations in the power subsector are:

- FY77 - Loan 1453-EGT, Regional Electrification Project (US\$48 million)
- FY79 - Loan 1733/Credit 935-EGT/Special Action Credit 20-EGT, Shoubrah El Kheima Power Project (Loan US\$102 million, Credit US\$37 million and Special Action Credit US\$35 Million)
- FY80 - Loan 1886/Credit 1052-EGT, Third Power Project (Loan US\$7 million and Credit US\$120 million)
- FY84 - Loan 1886-1-EGT, Power Supplemental Loan (US\$59 million)
- FY89 - Loan 3103-EGT, Fourth Power Project (US\$165 million)

The Project Performance Audit Report for Loan 1453-EGT (No. 5110) dated June 5, 1984 was submitted to the Board on June 19, 1984 and a combined Project Performance Audit Report for Loans/Credits 1733/935, 1886/1052 and 1886-1-EGT (No. 8819) was submitted to the Board on July 26, 1991. The Fourth Power Project is under implementation.

2.16 The completed operations have made substantial contributions to the development of Egypt's power subsector. They have: (a) facilitated the extension of electrical supply to the rural and urban areas; (b) supported installation of three units of 300 MW each at Shoubrah El Kheima thermal power station and four units of 67.5 MW each at Aswan II hydropower station located at the old Aswan dam; (c) supported installation of a combined cycle power plant of about 1,100 MW capacity located at Faraskur (Damietta); and (d) assisted institutional development through financing of technical assistance for project management, planning, training of technical and

financial staff, manpower development, and load research and load management. The ongoing Fourth Power Project when completed would, in addition to (c) and (d), improve the efficiency and provide 138 MW net additional generating capacity by conversion to combined cycle of the existing combustion turbines at Mahmoudia and Damanhour power stations.

2.17 From these operations, four important lessons have been learnt. The first important lesson learned was that it is unrealistic to set financial objectives for EEA in isolation without regard to the system of subsidies and controlled prices that pervades the Egyptian economy and have cross-sectoral impact. As a result of this lesson, the Bank decided in FY87 to seek agreement on the medium-term energy price reform goals and sought up-front energy price action consistent with reaching the end objective, prior to each energy sector lending operation. Thus, the Fourth Power Project was approved after the end objective of reaching economic levels by June 30, 1995 was agreed and an up-front energy price increase action was taken. The Gas Investment Project was approved after annual targets for reaching the end objective were agreed under the SAL (para. 1.12) and the FY91 action consistent with the target was taken. This project is being presented to the Board for approval after the Government has taken measures necessary to achieve, for petroleum products, the target ratio of 56 percent between the domestic and international prices (para. 1.12). In fact, as a result of the January 4, 1992 energy price increases carried out by the Government, the average weighted petroleum product price in Egypt is about 64 percent of the internationally traded equivalent, thus exceeding the target of 56 percent for December 1991. The second important lesson learned was that proper arrangements should be in place before making any major organizational changes in the existing set-up of the administrative functions of an institution. This was the case when the Government decided to divest EEA of the function of distribution of electricity and hand over the function to the EDA/EDCs. As a result, the intention of improving the service rendered to the electricity consumers could not be achieved. The third important lesson learned was that the targets for measuring financial performance should be derived from concepts which are fully understood and accepted by both parties and operational methodologies for calculating these targets should be clearly defined during appraisal and agreed during negotiations. As a result of this lesson and to avoid any misunderstanding, the financial covenants for the Fourth Power Project were appropriately drafted and discussed in depth with EEA during appraisal and negotiations. EEA is currently in compliance with these covenants. The fourth important lesson learned was that executing agencies should give more attention to the interaction between the activities of the different contractors and agencies at site to ensure smooth performance of critical activities at site. This was one of the reasons for complaints about delays at the site by the contractor for civil works for Aswan II hydropower station. To avoid such a situation, EEA intends to appoint the engineering consultant for the project early (by the end of March 1992) to coordinate the activities of the contractors and other agencies at site. Further, care would be taken during preparation of the bidding documents to clearly spell out, as far as possible, such interface activities in the bidding documents.

III. THE BORROWER

A. Background

3.01 The borrower of the proposed loan would be the Egyptian Electricity Authority (EEA).

3.02 Until 1964, generation, transmission and distribution of electricity in Egypt was in the hands of government, municipal and private organizations. In 1964, the Ministry of Electricity was formed in accordance with the Law No. 60 of 1963, consolidating all of the generation, transmission and distribution facilities under one state-controlled organization. In 1965, Presidential Decree No. 3726 was issued establishing the General Egyptian Electricity Corporation (GEEC) to: own and operate public power systems; plan power system expansion; and execute the required generation, transmission and distribution projects for the country. In 1971, the Rural Electrification Authority (REA) was created to plan and supervise the construction of rural electrification projects. Operation and construction of power system facilities were in the hands of GEEC and REA until in early 1976 Law No. 12/1976 was passed creating EEA which superseded GEEC¹. In addition, Law No. 27/1976 was passed in 1976 redefining the organizational structure of REA. In the same year two more authorities -- Nuclear Power Plants Authority and Qattara Depression Authority (now HPPEA) -- were established in the power subsector.

3.03 In 1978, the organizational structure of EEA was changed by a Cabinet Decree of March 6, 1978 with the creation of seven Electricity Distribution Companies (EDCs) as subsidiaries of EEA. The EDCs were formed to take over distribution of electricity while EEA provided certain specific services to EDCs such as research, training, foreign borrowing and procurement, long-range planning and major maintenance assistance. The EDCs commenced operation in 1979 without adequate preparation for transfer of authority inevitably causing some disruption in operations. This unsatisfactory situation continued till 1983 when by Law No. 97 of 1983 EDA was created and made responsible to oversee the operations of EDCs. EEA now is responsible for generation and transmission of electricity while EDA with EDCs is responsible for electrical distribution activities within Egypt.

B. Organization

3.04 Annex 3.1 gives the organization chart for EEA. EEA is a government-owned enterprise regulated by MEE. It is managed by the Chairman of the Board of Directors and assisted: (i) at the headquarters by five Deputy Chairmen (planning, project construction, operation, finance and administration); and (ii) in the field by Presidents of seven zones (Cairo,

¹/ Since EEA was not established under Law 97, it does not fall within the scope of public enterprises reforms envisaged under the SAL.

Alexandria, Canal, Middle Delta, West Delta, North Upper and South Upper Egypt). In FY90, EEA had five zones; however, in view of increasing activity in Delta and Upper Egypt zones, EEA split the Delta zone into Middle and West Delta zones, and the Upper Egypt zone into North Upper and South Upper Egypt zones.

3.05 EEA needs to further improve its administration systems, delegation of authority and coordination between its various disciplines, especially between technical and financial sections in the matters related to the planning. With the assistance from UNDP under the Data Bank Program, EEA has acquired office equipment for introduction of MIS (para. 2.14). However, except for certain technical planning and operation functions, adequate use of the facilities provided under the program has not been made. The proposed project would provide technical assistance for improving EEA financial and cost accounting systems and for training its staff in cost analysis techniques which are essential for reducing operating expenses.

3.06 Currently, EEA has about 37,800 employees, of which about 65 percent are technicians and craftsmen, 12 percent are engineers and chemists, and the balance of 23 percent are service and clerical staff. EEA carried out a manpower and training management study (April 1990) to review the surplus staff position. According to the findings of the study, by FY99, EEA would have a staff of about 47,100 out of which about 66 percent would be technicians and craftsmen, 13 percent would be engineers and chemists, and the balance of 21 percent would be service and clerical staff. At present, one out of nine employees is employed at the headquarters and this represents a high ratio that EEA is trying to reduce by decentralization of activities and delegation of responsibilities.

3.07 EEA was successful in attracting participation of cofinanciers for establishment of training centers at Cairo North (Bank), Cairo South (Bank, USAID and Canada), Abu Qir (Bank), Fayid (Germany), Talkha (Japan) and Aswan (Sweden). EEA aims at establishing additional training centers in the newly created zones (para. 3.04) and expanding scope of activities in the existing training centers. A few of the important ongoing training activities are: transmission training facility, funded by CIDA, Canada, scheduled for completion by December 1991; Abu Qir and Attaq power plant training simulators, funded by the Bank under the Vocational Training Project, scheduled for completion by December 1992; management development project, funded by USAID, scheduled for completion by the end of 1994; and live-line training project funded by France, scheduled for completion by December 1992. In addition, EEA sends its staff for training overseas under various supply and erect contracts for power stations, and transmission lines and substations.

C. EEA Existing Facilities

3.08 The power subsector in Egypt has grown substantially compared to 1952 when the power demand was only 110 MW. In FY91, the maximum demand of UPS was about 7,100 MW. In FY91, EEA had: (1) an installed generation capacity of 11,707 MW in its UPS distributed in three hydropower stations,

14 thermal steam power stations, and 21 combustion turbine and combined cycle power stations; (ii) an installed capacity of about 119 MW in its isolated system distributed in 11 combustion turbine/thermal power stations and one diesel power plant; (iii) 1,594 km of 500-kV, 4,720 km of 220-kV, 2,200 km of 132-kV and 4,470 km of 66-kV transmission lines; and (iv) substation capacities of 5,280 MVA at 500-kV, 12,430 MVA at 220-kV and 2,736 MVA at 132-kV. In FY91, EEA generated about 44,254 GWh of electricity and had electricity sales of about 39,529 GWh.

3.09 During FY85-91, EEA assets increased about six-fold from LE 1,731 million to LE 10,035 million. Its electricity sales during the same period increased by about six-fold from LE 288 million to LE 1,711 million.

IV. THE PROJECT

A. Project Origin and Objectives

4.01 Project Origin. To meet future demand for electricity, EEA, in 1984, initiated a feasibility study (funded by USAID) for Kureimat coal-fired thermal power station with a net installed capacity of 1,200 MW. Given the high petroleum prices in 1984 and the uncertainty of availability of natural gas for power generation, coal was the natural choice for the future power stations in Egypt. The consultants, Stone & Webster (S & W) completed the study in December 1985. However, the fall in petroleum prices in early 1986 and the incentives to the drilling companies given under the new "gas clause" approved by the Egyptian Parliament in early 1988, changed the Government's views regarding availability of natural gas for power generation. The Government/EEA approved the Damietta and Cairo South combined cycle power stations, and conversion to combined cycle of the existing combustion turbines at Talkha, Mahmoudia and Damanhour power stations. EEA also, through USAID funding, carried out a supplemental study with the objective of evaluating future availability of natural gas for power generation and appropriately modifying the feasibility study for Kureimat power station. The study indicated restricted availability of natural gas for use in power stations. In view of this, and environmental limitations imposed by use of fuel oil alone for the power station, the consultants revised the feasibility study in June 1989. The revised study, which compared the costs of installing a fuel oil, gas, coal and combined-cycle power station at each of the five potential sites¹ (Annex 4.1, para. 2), recommended installation of a dual fuel (fuel oil and natural gas) fired thermal power plant at Kureimat as the lowest-cost solution for meeting the future demand in FY96-97.

4.02 Project Objectives. The project objectives are to assist EEA in: (a) alleviating power shortages; (b) meeting the growing demand for electricity; (c) improving the efficiency and reliability of the EEA interconnected system; (d) strengthening the EEA financial position; and

1/ The five potential sites considered being: (a) the four inland sites of Attaq, Cairo North, Gamasa, Mit Ghamr and Kureimat; and (b) Gamasa located on the Mediterranean coast in the North Delta region.

(e) strengthening the institutional capabilities by improving technical and managerial skills of EEA staff.

B. Rationale for Bank Involvement

4.03 The Bank's country assistance strategy gives high priority for lending to the energy sector, considering the sector's effect on balance of payments and GDP growth. Rapid development of electricity and natural gas production is the key to supporting development of production sector in a sustainable way. However, given the low domestic energy prices (paras. 1.11 and 2.07), the Bank lending in the energy sector is designed to support energy pricing reforms to achieve economic levels (paras. 1.12 and 2.17). With the approval of IMF Stand-by (May 1991) and SAL (June 1991), the Government is committed to increase the petroleum, natural gas and electricity prices to economic levels (para. 1.12) by FY95. The Bank's involvement in this project and the power subsector enables the Bank to: (i) assist the Government in increasing the weighted average electricity price to attain LRMC costs by FY95; (ii) ensure rational least-cost investments in power subsector; (iii) help the Government to mobilize foreign financial resources for power subsector development through effective cofinancing; and (iv) ensure, through technical assistance, efficient institutional development of EEA which is a prerequisite for ensuring efficient and reliable supply of electricity -- an essential infrastructure for stimulating growth of non-oil exports to improve Egypt's economy.

C. Project Description

4.04 The project would consist of the following components:

(i) The supply and installation of a dual fuel-fired (fuel oil and natural gas) thermal power station with a net installed capacity of 1,200 MW at Kureimat located on the east bank of the river Nile, about 95 km south of Cairo in the Giza Governorate.

(ii) The supply of material and equipment for about 162 km of a 20-inch diameter natural gas pipeline (including a pressure reducing and metering station) interconnecting the power station with the gas grid.

(iii) The supply and installation of: (a) about 150 km of 500-kV transmission lines interconnecting the power station to UPS; (b) about 90 km of 220-kV transmission lines to assist EEA in transmission of power to the load centers; (c) the equipment for rehabilitation of the Tanta 220-kV/66-kV substation located in the Delta zone and thereby assisting EEA in improving the reliability of its electrical transmission system; and (d) the line loss reduction equipment (capacitors) with a total capacity of about 500 MVAR for improving the efficiency of transmission of power from power stations to the load centers.

(iv) technical assistance for the: (a) preconstruction and construction phase engineering consultancy services; (b) consultancy services for training of EEA staff and procurement of training equipment; (c) consultancy services and equipment for electricity/energy data bank and provision of software and hardware required for project management system; (d) consultancy services and hardware and software for implementation of a computerized financial management system with a special emphasis on implementation of an effective cost control management system; and (e) procurement of about 1,000 special meters for introduction of an efficient load management system.

A full description of the four project components is provided in Annex 4.1.

4.05 Component I. Kureimat power station would have: (a) two steam turbine generators each of 600 MW net capacity with auxiliaries and peripheral facilities; (b) two steam generators (boilers) with auxiliaries and having full load capability using either natural gas or fuel oil; (c) fuel oil and natural gas handling system; (d) water and waste treatment plants, electrical switchyard and miscellaneous electrical facilities; (e) mechanical piping and miscellaneous mechanical equipment; (f) circulating (cooling) water system; and (g) buildings, service and maintenance facilities, colony and other civil works. Assuming a 50:50 fuel mix, the power station would annually consume about 936 million m³ of natural gas and about 0.9 million tons of fuel oil to generate 7,730 GWh of electricity. The make up and circulating water requirements of the power station and colony would be met from the Nile river. Fuel oil requirements for the power station would be met from the 14-inch oil pipeline (from Mostorod refinery to Beni Suef) which runs by the Kureimat site. Component II covers the requirements for supply of natural gas to the Kureimat site.

4.06 Component II. Natural gas to the power station would be supplied by tapping (at Zafarana) the existing Ras Shokir-Port Said natural gas pipeline running along the Gulf of Suez coast. The component provides for supply of material and equipment for the installation of about 162 km of a 20-inch diameter natural gas pipeline from Zafarana to the Kureimat power station site. In addition, the component includes the cost of the equipment for pressure reducing and metering station to be located at the power station site. For reasons given in para. 4.09, the installation of the pipeline is considered reserved procurement and is excluded from the component.

4.07 Component III. With the additions of new generation capacity and increase in demand for power, the EEA interconnected system needs to be strengthened. In addition, some of the equipment in the substations needs to be replaced/rehabilitated. Accordingly, the component provides for: (a) about 150 km of 500-kV transmission lines to interconnect Kureimat power station to UPS; (b) about 90 km of 220-kV transmission lines (Tanta-Kalyobea and Abu Sultan-Manayef) to transmit electrical power to the load centers which cater for the consumer demand for electricity; (c) rehabilitation of Tanta substation and replacement of the existing low-capacity switchgear at the substation with that of a higher capacity to meet the increased power

requirements in the Delta zone; and (d) installation of about 120 capacitor banks, with a total capacity of about 500 MVAR at about 50 substations in the UPS, to assist EEA in improving efficiency of transmission of power from power stations to the load centers.

4.08 Component IV. The component includes preconstruction and construction phase engineering consultancy services (1,500 foreign and 1,000 local expert-months), funded by USAID, to assist EEA in timely procurement, installation and commissioning of equipment at the power station site. In addition, the engineering consultant would be responsible for procurement, installation, operation and maintenance of the equipment at environmental monitoring station to be established at the power station site for taking meteorological measurements and measurements of background pollution at the site for a period of at least one year during the preconstruction phase (Annex 4.7, para. 8). In addition, the engineering consultants would also be responsible for measurements regarding the physical conditions at the site and the hydrology of the Nile river. To minimize the risk of not achieving the financial targets in future and to keep the future tariff increases to the minimum (paras. 1.14 and 1.16), EEA needs to minimize its operating expenses by controlling costs. Accordingly, consultancy services (about 100 expert-months) are provided under the component for assisting EEA in implementation of computerized financial management system with a special emphasis on effective cost control systems. EEA has the basic equipment for MIS system (para. 2.14). However, the introduction of MIS system has been delayed. The component provides for about 10 expert-months of consultancy services, and hardware and software to cover EEA's immediate needs for introducing MIS and project management systems. With the increase in electricity tariffs, EEA proposes to procure about 1,000 meters for introduction of special tariffs for major industrial consumers and EDCs which obtain bulk supply of electricity from EEA at various points (para. 2.03). The procurement of special meters would also assist EEA in implementing load management measures. The supplemental loan for the Third Power Project provided funds for the first phase of training EEA staff and trainers in instrumentation and controls which is an important feature of a modern power station. In addition, the component provides for: (i) about 12 expert-months of consultancy services and 60 trainee-months of training overseas of EEA staff under the second phase of training of EEA staff and trainers in instrumentation and controls; and (ii) training equipment for the training center to be established at Minia in the North Upper Egypt Zone.

D. Implementing Agencies

4.09 EEA would be the implementing agency for components I, III and IV while EGPC would be the implementing agency for the component II (natural gas pipeline). The cost of material and equipment for the natural gas pipeline is included in the project cost. However, the project cost excludes the cost of installation of the pipeline (which is considered as reserved procurement) since EGPC would follow its normal practice of awarding the installation contract to PETROJET, a company under its control. Therefore, even though the installation cost is not included in the project cost, it is included in the total financing required for the project (Table 4.1). The natural gas

pipeline, which is essential for assuring timely and adequate supply of natural gas for the project, would be wholly owned and operated by EGPC. Therefore, EEA would enter into a subsidiary loan agreement (para. 4.12) for onlending the Bank funds to EGPC for the cost of material and equipment required for the installation of the pipeline. The financial performance of EGPC, carried out under the Gas Investment Project approved by the Board in June 1991, is given in Section VI, Finance (EGPC).

E. Cost Estimates

4.10 The total project cost, excluding interest during construction (about US\$119.3 million), is estimated to be about US\$1,260.9 million of which about 79 percent amounting to about US\$1,000.1 million is in foreign exchange. An exchange rate of 1 US\$ = LE 3.33 as of July 1, 1991, has been used for converting base costs and physical contingencies from one currency to another. However, calculation of the total project cost (including contingencies) has been based on the assumption that purchasing power parity would be maintained over the project implementation period. A summary of the cost estimates for the project is given below in Table 4.1 and detailed in Annex 4.2.

Table 4.1: SUMMARY OF THE PROJECT COST

	In Million LE			In Million US\$			Foreign as % of Total
	Local	Foreign	Total	Local	Foreign	Total	
I. Kureimat Power Station							
Siteworks and Civil Works	174.4	273.5	447.9	52.9	82.9	135.8	61
Steam Generators	97.4	420.0	517.4	29.5	127.3	156.8	81
Steam Turbine Generators	45.5	397.3	442.8	13.8	120.4	134.2	90
Water and Waste Treatment	3.3	58.6	61.9	1.0	17.8	18.8	95
Mechanical Equipment and Piping	76.4	401.2	477.6	23.2	121.6	144.8	84
Instrumentation and Controls	5.1	85.1	90.2	1.5	25.8	27.3	95
Electrical Equipment and Cables	97.6	432.5	530.1	29.6	131.0	160.6	82
Training Simulator	3.5	10.0	13.5	1.1	3.0	4.1	73
Environmental Monitoring Equipment	0.4	6.8	7.2	0.1	2.0	2.1	95
Wrap-up Insurance	0.0	21.5	21.5	0.0	6.5	6.5	100
BASE COST	503.6	2,106.5	2,610.1	152.7	638.3	791.0	81
Physical Contingencies	57.1	215.9	273.0	17.3	65.4	82.7	79
SUBTOTAL	560.7	2,322.4	2,883.1	170.0	703.7	873.7	81
Price Contingencies	387.8	1,620.5	2,008.3	28.9	121.9	150.8	81
TOTAL I	948.5	3,942.9	4,891.4	198.9	825.6	1,024.5	81
II. Gas Interconnection (Pipeline)							
Equipment Supply and Installation	26.6	103.5	130.1	8.1	31.4	39.5	80
BASE COST	26.6	103.5	130.1	8.1	31.4	39.5	80
Physical Contingencies	2.7	10.3	13.0	0.8	3.1	3.9	80
SUBTOTAL	29.3	113.8	143.1	8.9	34.5	43.4	80
Price Contingencies	21.9	85.3	107.2	1.7	6.7	8.4	80
TOTAL II	51.2	199.1	250.3	10.6	41.2	51.8	80
III. Transmission Lines							
Station Interconnection to the Grid	36.0	67.4	103.4	10.9	20.4	31.3	65
Other Transmission Lines (incl. s/s rehab.)	66.7	167.9	234.6	20.2	50.8	71.0	72
BASE COST	102.7	235.3	338.0	31.1	71.2	102.3	70
Physical Contingencies	10.3	23.5	33.8	3.2	7.2	10.4	69
SUBTOTAL	113.0	258.8	371.8	34.3	78.4	112.7	70
Price Contingencies	76.9	172.9	249.8	5.6	12.5	18.1	69
TOTAL III	189.9	431.7	621.6	39.9	90.9	130.8	70
IV. Technical Assistance							
Engineering Consultancy Services	29.0	94.2	123.2	8.8	28.5	37.3	76
Training Consultancy Services & Equipment	2.0	13.6	15.6	0.6	4.1	4.7	87
Data Bank and Management Information System	1.1	8.9	10.0	0.3	2.7	3.0	90
Load Management Equipment	0.1	1.7	1.8	0.0	0.5	0.5	100
BASE COST	32.2	118.4	150.6	9.7	35.8	45.5	79
Physical Contingencies	0.2	1.6	1.8	0.1	0.5	0.6	83
SUBTOTAL	32.4	120.0	152.4	9.8	36.3	46.1	79
Price Contingencies	22.0	82.2	104.2	1.6	6.1	7.7	79
TOTAL IV	54.4	202.2	256.6	11.4	42.4	53.8	79
TOTAL PROJECT COST (I+II+III+IV)							
BASE COST	665.1	2,563.7	3,228.8	201.6	776.7	978.3	79
Physical Contingencies	70.3	251.3	321.6	21.4	76.2	97.6	78
SUBTOTAL	735.4	2,815.0	3,550.4	223.0	852.9	1,075.9	79
Price Contingencies	508.6	1,960.9	2,469.5	37.8	147.2	185.0	80
TOTAL PROJECT COST	1,244.0	4,775.9	6,019.9	260.8	1,000.1	1,260.9	79
V. Reserved Procurement (Gas Pipeline Erection)							
	28.6	0.0	28.6	6.0	0.0	6.0	0
VI. Interest During Construction							
Bank Financed	0.0	152.8	152.8	0.0	32.5	32.5	100
Others	0.0	471.2	471.2	0.0	86.8	86.8	100
TOTAL V	0.0	624.0	624.0	0.0	119.3	119.3	100
TOTAL FINANCING REQUIRED (I+II+III+IV+V+VI)							
	1,272.6	5,399.9	6,672.5	266.8	1,119.4	1,386.2	81

The cost estimates are based on experience with recent contracts for similar equipment and are considered to be reasonable for this type of project. The cost estimates include duties and taxes paid to the Government by EEA. Overall physical contingencies of 10 percent are added except for: (a) the civil works for which about 15 percent physical contingencies have been added; and (b) the consultancy services' portion of the technical assistance component for which no physical contingencies are included. Price contingencies have been added to the base cost plus physical contingencies on the following annual inflation rate projections (based on the Bank estimates):

<u>EEA's Fiscal Year</u>	<u>FY91</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>
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Costs expressed in:

US\$ (%)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
LE (%)	20.0	28.0	15.0	9.0	6.0	5.0	5.0	5.0	5.0

It is estimated that about 1,620 foreign expert-months and 1000 local expert-months are required for the consultancy services included in the technical assistance component. The project cost includes duties and taxes amounting to LE 215.7 million (about US\$45.1 million).

F. Project Financing Plan

4.11 The financing plan for the project is summarized in Table 4.2 below. During negotiations, EEA informed that: (a) the agreement with the African Development Bank (ADB) for a loan amount of about US\$350 million was signed on May 30, 1991; (b) the agreement with the Arab Fund for Economic and Social Development (AFESD) for an amount of about US\$125 million was signed on June 13, 1991; (c) the agreement with the Saudi Government for a grant of about US\$50 million is effective; and (d) the first amendment to the grant agreement with USAID for an amount of US\$100 million for the Kureimat power station signed in August 1990 is operative and the second amendment to the grant agreement for an additional amount of US\$100 million for the power station was signed on September 9, 1991. Based on the above information, the financing plan is given in Table 4.2 below. During negotiations, assurances were obtained from the Egyptian delegation that EEA/EGPC would finance the local currency cost of the project (US\$266.8 million)¹, and the foreign exchange requirements for: (i) project wrap-up insurance (US\$7.6 million); (ii) colony civil works (US\$1.7 million); (iii) interest during construction for the project (US\$119.3 million); and (iv) any foreign exchange gap for the project (currently estimated at US\$52.0 million) taking into account the agreements reached with the cofinanciers. Assurances were also obtained from the Government that it would take all necessary measures to enable EEA to cover any financing gap.

¹/ EEA/EGPC would generate adequate cash to cover the local currency cost of US\$266.8 million (about LE 1,272.6 million) of the project. In the event of failure of EEA/EGPC to do so, it was agreed that the Government would cover the shortfall in the local currency requirements of the project.

Table 4.2: PROJECT FINANCING PLAN
(in US\$ Million)

<u>Funding Agency</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>% of Financing Plan</u>
1. IBRD	-	220.0	220.0	16
2. ADB	-	350.0	350.0	25
3. AFESD	-	125.0	125.0	9
4. USAID <u>1/</u>	-	193.8	193.8	14
5. Saudi Arabia	-	50.0	50.0	4
6. EEA/EGPC	266.8	180.6	447.4	32
TOTAL	<u>266.8</u>	<u>1119.4</u>	<u>1386.2</u>	<u>100</u>

1/ Though USAID funding of US\$200 million would be available for the project, only the amount estimated for funding of USAID bid packages is included in the financing plan.

G. On-lending Arrangement

4.12 For reasons given in para. 4.09, the Bank funding for the natural gas pipeline would be for supply of material and equipment for the pipeline and would exclude the cost of installation of the pipeline. The pipeline would be fully owned, operated and maintained by EGPC, and agreement has been reached that the Borrower, EEA would enter into a subsidiary loan agreement with EGPC for the on-lending of Bank funds for the cost of materials and equipment required to construct the pipeline for supplying the required quantity of natural gas to the power station (para. 4.34). EGPC would repay the amount on-lent to it over a period not more than 20 years including a 5-year grace period. The interest rate (currently at 7.73 percent), the commitment charges and amounts of currencies in which debt service payments would be made would be the same as paid by EEA to the Bank for the loan. EGPC would also bear the foreign exchange risk with respect to the on-lent amount. EGPC may, therefore, make debt service payments in: (i) the same currency or currencies in which EEA would make payments to the Bank; or (ii) the local currency equivalents calculated at the time of making the debt service payments. During negotiations, agreement was reached with the Egyptian delegation that the signing of a subsidiary loan agreement, satisfactory to the Bank, for the money on-lent by EEA to EGPC would be a condition of loan effectiveness.

H. Procurement

4.13 All Bank-financed procurement for civil works, and the supply and installation of materials and equipment would be according to the Bank's

Procurement Guidelines. Procurement of technical assistance services would follow the Bank's Guidelines for Use of Consultants in Bank-financed projects.

4.14 The Bank financing is proposed for the following 16 main bid packages:

- (a) supply of non-critical piping and valves and installation of pump drives, feed water heaters, deaerators, condensers, waste and water treatment system, piping and valves and other miscellaneous equipment;
- (b) supply of instruments and controls;
- (c) supply and installation of training simulator;
- (d) supply of gas piping, material, fittings and tools;
- (e) supply of pressure reducing and metering equipment;
- (f) supply of pipe coating material;
- (g) supply and installation of Tanta substation rehabilitation equipment;
- (h) supply of 220-kV transmission line materials;
- (i) supply of line loss reduction equipment;
- (j) supply and installation of data bank/MIS equipment;
- (k) & (l) supply of training and load management equipment;
- (m), (n) & (o) consultancy services for training, data bank/MIS and financial management systems; and
- (p) training overseas of EEA staff.

Except for small value items under packages (a), (g), (j) and (k), International Competitive Bidding (ICB) procedures, according to the Bank's Procurement Guidelines, would be followed for packages (a) through (l). For procurement of goods under ICB, bidders offering domestically manufactured goods and satisfying the criteria for the margin of preference, would receive a margin of preference in bid evaluation of 15% of the CIF price of the imported goods offered by the competing bidders or the prevailing customs duty applicable to the non-exempt importers, whichever is less. Procurement of technical assistance services under packages (m), (n) and (o) would follow the Bank's Guidelines for Use of Consultants by World Bank Borrowers.

4.15 International Shopping, according to the Bank's Procurement Guidelines, would be followed for procurement of the small value items under packages (a), (g), (j) and (k) for: (i) valves and tees and special pipe joints required for piping supply and erection; (ii) instruments, relays and

testing equipment required for rehabilitation of the Tanta substation; and (iii) tools and instruments for training and data bank/MIS equipment. Procurement following International Shopping Procedures would involve obtaining at least three price offers for the required goods from at least two eligible source countries and would be limited to US\$70,000 per contract and US\$500,000 in aggregate.

4.16 Direct contracting following Bank's Procurement Guidelines would be followed for obtaining relays, instruments, recorders required to match existing equipment at the Tanta substation proposed for rehabilitation under package (g), para. 4.14. Total foreign exchange expenditure under this procedure would be limited to about US\$100,000.

4.17 EEA would follow its own bidding procedures for award of contract (financed by EEA) for the installation of material for transmission lines procured under item (h), para. 4.14. Similar arrangement is being followed for the transmission line component under the ongoing Fourth Power Project. As regards items (i) and (l), para. 4.14 (line loss and load management equipment), EEA staff has the necessary experience and would install the equipment. In view of the scattered nature of the works, the proposed arrangement is satisfactory.

4.18 As mentioned in para. 4.09, EGPC would award contract to PETROJET (a company controlled by EGPC) for installation of the natural gas pipeline material and equipment procured under packages (d), (e) and (f) which are funded by the Bank. PETROJET has been installing natural gas pipelines and has a good track record for the quality of work and timely completion of the job. Since EGPC would be directly awarding the contract for installation of the pipeline to PETROJET without inviting offers from other firms, the installation contract for the pipeline is considered as reserved procurement and does not form part of the project.

4.19 All documents relating to the procurement of Bank-financed consultancy services would be subject to the Bank's prior review. All bidding packages for works and goods estimated to cost US\$300,000 equivalent or more would be subject to the Bank's prior review of the bid packages. These limits would result in prior review of about 99 percent of the loan amount. Other contracts for works and goods would be subject to the Bank's review after award of the contracts. In view of the importance of proper installation of the mechanical system for efficient and reliable operation of the power station, prequalification procedure according to the Bank's procurement guidelines would be followed for the bid package (a) supply and installation of piping and mechanical equipment. Similarly because of the explosive nature of the gas handled by the natural gas pipeline, it is essential that the quality of material and equipment procured for the pipeline is assured. Therefore, it was agreed with EEA/EGPC that prequalification procedure according to the Bank's Guidelines would be followed for the bid packages (d), (e) and (f). Detailed project cost tables (Annex 4.2) provide the local and foreign cash flow for the bid packages. The procurement timetable for the project is given in the project implementation schedule (Annex 4.4). The details of the implementing agencies are given in Section III, and paras. 1.18 and 4.09. Both the implementing agencies (EEA and EGPC) have adequate

experience of Bank-funded projects. EEA is familiar with the technology used in the project and has had 300-MW units in operation in its system since 1985. The 600-MW unit size is being introduced for the first time in EEA's system. Therefore, to reduce the risk of implementation delays, EEA would be assisted during the preconstruction and construction phases of the project by an engineering consultants (funded by USAID) who would provide procurement assistance to EEA from preparation of the bid documents to award of the contracts. EGPC has adequate experience in preparation of the bid documents for the natural gas pipeline and installation of the pipelines; therefore, no assistance is needed for implementation of Component II for which EGPC is the implementing agency.

4.20 Procurement arrangements are summarized in Table 4.3.

Table 4.3: SUMMARY OF PROPOSED PROCUREMENT ARRANGEMENTS
(in US\$ Million Equivalent)

Project Element	Procurement Method		N.B.F.	Total Cost
	ICB	Other		
<u>Component I. (Kureimat Power Station)</u>				
A. Works				
1. Land (Power Station and Colony)			0.6	0.6
2. Structural Piling			8.3	8.3
3. Station Civil Works and Structural Steel			148.3	148.3
4. Colony Civil Works			23.4	23.4
B. Goods				
1. Steam Generators			205.2	205.2
2. Steam Turbines			176.3	176.3
3. Water and Waste Treatment Systems			24.2	24.2
4. Feed Water Heaters, Deaerators, Condensers and Equipment			24.9	24.9
5. Pumps and Drives			26.6	26.6
6. Critical Piping, Valves and Miscellaneous Equipment			37.2	37.2
7. Non-critical Piping, Valves Supply, and Mech. Systems, Equipment and Piping Erection	83.4 (67.6)	0.2 (0.2) 1/		83.6 (67.8)
8. Instrumentation and Controls	34.6 (32.6)			34.6 (32.6)
9. Yard Tanks			13.6	13.6
10. Electrical Distribution Equipment			53.9	53.9

Project Element	Procurement Method		N.B.F.	Total Cost
	ICB	Other		
11. Electrical Systems, Cables, Equipment and Instruments			71.7	71.7
12. Switchyard			76.6	76.6
13. Training Simulator	5.2 (3.9)			5.2 (3.9)
C. Services				
1. Wrap-up Insurance			7.6	7.6
<u>Component II. (Gas Pipeline) 2/</u>				
A. Goods				
1. Gas Pipeline (material, Fittings and Tools)	43.4 (34.2)			43.4 (34.2)
2. Metering and Pressure Reducing Station	2.1 (1.0)			2.1 (1.0)
3. Pipe Coating Material	6.3 (6.0)			6.3 (6.0)
<u>Component III. (Transmission Lines)</u>				
A. Goods				
1. 500-kV Power Station Interconnection to Grid			39.6	39.6
2. 220-kV Transmission Lines	19.9 (13.5)	7.7 3/		27.6 (13.5)
3. Substation Rehabilitation	54.2 (43.5)	0.2 (0.2) 4/		54.4 (43.7)
4. Line Loss Reduction Equipment (Capacitors)	8.2 (7.9)	0.9		9.1 (7.9)
<u>Component IV. (Technical Assistance)</u>				
A. Consultancies				
1. Preconstruction and Construction Engineering Services (incl. Supply and Installation of Environmental Monitoring Equipment)			46.0	46.0
2. Training Consultancy Services		1.1 (1.0)		1.1 (1.0)
3. Data Bank/MIS and Financial Consultancy Services		2.2 (1.9)		2.2 (1.9)
B. Goods				
1. Training Equipment	4.9 (4.4)	0.1 (0.1) 5/		5.0 (4.5)
2. Data Bank/MIS Equipment	1.5 (1.3)	0.1 (0.1) 5/		1.6 (1.4)
3. Load Management Equipment (Meters)	0.7 (0.6)			0.7 (0.6)
<u>Reserved Procurement</u>				
A. Goods				
1. Gas Pipeline Erection			6.0	6.0
<u>Miscellaneous</u>				
1. Interest During Construction			119.3	119.3
Total	264.4 (216.5)	13.0 (3.5)	1108.8	1386.2 (220.0)

1/ Small-value items up to US\$0.2 million to be procured following international shopping procedure.

2/ The material and equipment supplied under the component would be erected by PETROJET, a company under the control of EGPC. Therefore, the erection of material and equipment is considered as reserved procurement.

3/ EEA would follow its own procedures for installation of the transmission lines.

4/ Small-value items up to US\$0.1 million to be procured following international shopping procedure; balance up to US\$0.1 million to be procured by direct contracting procedure.

5/ Small-value items up to US\$0.1 million to be procured following international shopping procedure.

Notes: 1. Figures in parentheses are the amounts to be financed by the Bank.

2. Amounts may not tally with those in the Project Cost Summary Table 4.1 due to rounding.

3. N.B.F.: Not Bank-financed.

I. Disbursement and Special Account

4.21 The proceeds of the loan would be disbursed over eight years (FY92-FY99) on the following basis:

(a) 100 percent of the foreign expenditures and 100 percent of the local expenditures (ex-factory cost) for supply and installation of the mechanical piping/erection, training simulator, substation rehabilitation and Data Bank/MIS equipment contracts;

(b) 100 percent of the foreign (c.i.f.) expenditures and 100 percent of the local expenditures (ex-factory cost) for supply of instrumentation and controls, natural gas pipeline material and equipment, transmission line material, loss reduction equipment and training and load management equipment contracts;

(c) 100 percent of the foreign expenditures for training, Data Bank/MIS and financial management consultancy services;

(e) 100 percent of the foreign expenditures for overseas training of EEA staff; and

(f) 100 percent of the foreign expenditures and 100 percent of the local expenditures (ex-factory cost) for supply of small value items procured for mechanical/piping, substation rehabilitation, training equipment and Data Bank/MIS equipment contracts awarded following international shopping/direct contracting procedures.

4.22 The disbursement schedule (Annex 4.3) follows the EMENA (MENA and ECA) power sector profile modified to take into account advance payment made while opening of the Special Account. In order to enable EEA to effectively implement the project and to ensure prompt payments to the contractors and consultants, the Bank would advance funds as needed to a Special Account¹ to be opened at a commercial bank in Egypt for a maximum amount of US\$9.0 million, which is expected to cover the Bank's share of eligible expenditure over a period of four months. Payments from the Special Account would only be made for eligible expenditures indicated in the loan agreements. The account would be denominated in US dollars and replenished against withdrawal applications of at least US\$500,000. Applications with appropriate supporting documentation should be submitted when approximately half of the maximum allocated amount of the Account has been spent or quarterly, whichever occurs first. Disbursements under the project would be made against standard documentation except for contracts of US\$50,000 equivalent or less, which would be claimed under Statements of Expenditures (SOE). Related supporting documents for SOE claims would be retained at EEA's headquarters and made

^{1/} The Disbursement Letter to be furnished by the Bank to EEA would propose that until the Special Account is in operation, EEA would submit to the Bank, to the extent possible, withdrawal application each for a minimum amount of US\$220,000 equivalent.

available for inspection by the Bank missions and project auditors. The Loan Closing Date would be June 30, 1999.

J. Project Status and Implementation

4.23 Engineering Consultancy Services. The preconstruction and construction phase engineering consultancy services are funded by USAID (para. 4.08). EEA has evaluated the offers from the short-listed consultants and the award of contract for engineering consultancy services is scheduled before the end of March 1992. The consultants would provide assistance to EEA for activities related to procurement, supervision during construction and commissioning of the power station and 500-kV transmission lines, and supply and installation of environmental monitoring equipment (para.4.08). Further, during negotiations, EEA agreed that the consultants would take measurements of background pollution at regular intervals and submit, to the Bank, semi-annual reports regarding their findings. The background pollution measurements are scheduled to be started by March 1993, the first semi-annual report is due by October 1993 and the final report would be submitted by the consultants by March 1994. EEA would ensure that the consultant's reports are submitted to the Bank semi-annually. During negotiations, assurances were obtained from EEA that it would continue to employ engineering consultants throughout the project implementation period for pre-construction, construction and commissioning services. EEA, through its Deputy Chairman for Projects, would be responsible for the engineering services required for the 220-kV transmission lines and 220-kV/66-kV substation rehabilitation and installation of the line loss reduction equipment at the substations. The Vice Chairman, Natural Gas, EGPC would be responsible for the procurement and installation activities under Component II.

4.24 Consultancy Services for Project Management System and Data Bank/MIS. The consultancy services for Data Bank/MIS and project management system would provide supplemental assistance in implementation of MIS system funded by UNDP (para. 2.14), and would include assistance to EEA in preparation of bid documents, evaluation of offers received and award of contract for the equipment, hardware and software required for the system.

4.25 Project Management. The Deputy Chairman for Projects located at EEA headquarters would be responsible for Components I, III, engineering consultancy services under Component IV and overall coordination with EGPC, the implementing agency for Component II. The day-to-day construction activities in the field would be the responsibility of: (a) the President, North Upper Egypt Zone, assisted by the power station superintendent for Kureimat power station and the 500-kV transmission line interconnection with UPS; and (b) the Presidents of Middle Delta and West Delta Zones for the transmission lines and substation rehabilitation under Component III located within their zonal boundaries. The Deputy Chairman for Studies, Research and Planning located at EEA headquarters would be responsible for the Data Bank/MIS system and load management subcomponents under component IV. The Deputy Chairman for Administration Manpower and Training would be responsible for the training subcomponent under component IV. The Deputy Chairman for Finance would be responsible for the activities associated with the

consultancy services for computerized financial management with a special emphasis on cost control systems. These arrangements have been employed by EEA for the previous Bank-financed projects and are satisfactory.

4.26 Land Acquisition. EEA has acquired about 840,000 m² (about 200 faddans) of land required for the power station and the colony out of which about 210,000 m² of land along the river was occupied by about 96 farmers for cultivation. There is no relocation of people involved. During negotiations, EEA confirmed that it has followed the law of the country for expropriation of private property for public purposes in acquiring the agricultural land for the power station. EEA deposited with the Egyptian Survey Authority (ESA) the amount of about LE 950,000 determined by ESA as necessary to compensate all 96 farmers for the agricultural land acquired for the power station. The law requires that: (i) the decree to acquire the land be issued by the Prime Minister; (ii) the compensation be determined according to the fair market value of the land being acquired; and (iii) the amount so determined (by ESA) be open for judicial review. Further, ESA has issued a public notification regarding the compensation on December 14, 1991 giving a period of two months for receiving any objections for payment of compensation to 96 farmers. Soon after the expiry (on February 14, 1992) of the two-month waiting period required by Egyptian law to ensure that the compensation is paid to the lawful occupiers of the land, ESA expects to complete the payments to the farmers. In addition, EEA has agreed to abide by the court decision in the event of any complaint (against the compensation) lodged by any farmer whose agricultural land has been acquired for the power station. Further, EEA has agreed to give priority for employment of the farmers or their children for works at the power station site and has agreed to let the farmers raise crops on the land till the portion of the land is required for the construction activity at the site.

4.27 Switchyard. Bids for the power station switchyard (funded by Saudi Arabia) were received in April 1991 and contract award finalized on August 25, 1991.

4.28 Environmental Impact Assessment Report (EIAR). The EIAR summary furnished by the borrower was submitted to the Board on July 11, 1991 and the final report incorporating the comments of the Bank, USAID and EEA was found to be satisfactory to the Bank.

4.29 Project Implementation Schedule. The project implementation schedule is given in Annex 4.4. The project is scheduled for completion by June 30, 1997. Annex 4.5 gives the broad reporting requirements for monitoring the project. These requirements would assist EEA in: (i) providing the Bank with monthly and semi-annual progress reports based on the outline agreed during negotiations; and (ii) monitoring key performance indicators such as auxiliary consumption and fuel consumption rate in its power stations, availability and capacity factors of the generating units, transmission line losses and quality of service. During negotiations, agreement was reached with EEA regarding the proposed reporting arrangements.

K. Project Supervision Plan

4.30 The Bank would normally supervise the project twice a year. The core team for the mission would comprise a power engineer and a financial analyst. The core team would be supplemented, as necessary, by: an economist; a technical expert in generation, transmission and distribution; and an expert in environmental management. About 14 supervision missions are scheduled during the project implementation period and the total supervision effort is estimated to require an average of 10 staffweeks per year. Annex 4.6 gives the tentative supervision plan.

L. Environmental Aspects

4.31 The project falls under the environmental screening category "A". The environmental issues involved relate to: (a) compensation to the farmers for the agricultural land acquired for the project; (b) establishment of an Environmental Management Unit (EMU) at the power station site to ensure compliance with the environmental mitigation measures during preconstruction, site preparation, construction and operational activities related to the power station, natural gas supply and transmission lines; (c) land use; (d) water use and quality; (e) waste and water treatment; (f) stack emissions; (g) ambient air quality; (h) noise pollution; and (i) natural gas pipeline and transmission line corridors. The issues are discussed in detail in the EIAR and are summarized in Annex 4.7. The proposed site was selected after comparing the economics and environmental aspects of five sites. Kureimat site, which is located in a relatively undeveloped area, has a minimal floodplain and was found to be environmentally acceptable provided certain steps mentioned in paragraphs below are observed.

4.32 Land Use. No resettlement issues are involved and EEA has compensated the 96 farmers whose agricultural land has been acquired for the project according to the law of the country (para. 4.26). It is estimated that a staff of about 530 would be required for the operation and maintenance of the power station. Considering that some of the unskilled staff would reside in the nearby villages, a colony comprising 418 housing units has been provided. Since adequate public services are not available in the nearby villages, provision has been made for facilities such as: telephone, telegram and post office; police and fire station; nursery and primary school; commercial and shopping center, and religious and recreational centers; utilities and transportation units; and colony administration unit. Offices of EEA and its contractors would be located at the power station site. Housing for the construction force, estimated at 3,000 during the peak of the construction period, would be located within or adjacent to the colony site.

4.33 Water Use and Quality. The water requirements for the power station and the colony would be drawn from the Nile river. Currently, the controlled seasonal river flows passing the Kureimat site vary from about 52,000 to 97,200 m³ per minute. The water requirement for the power station and the colony are of two types: (a) circulating water required for condensers which condense the exhaust steam from the steam turbines into water; and (b) water required for boiler make-up, plant services and the

colony. The circulating water drawn from the river flows through the condensers and picks up the heat from the exhaust steam (and in the process increases its temperature by about 10°C above the inlet water temperature) before being discharged in the river. Thus, the quantity of 2,400 m³ per minute required for the circulating water is a non-consumptive use of the river water. Circulating water discharged in the river forms a thermal plume in the river with a surface temperature of about 3°C above the ambient water temperature. Even under the worst-case scenario in summer (on occasions during August through October), the surface temperature of water would not exceed 35°C and would be within the limits acceptable to the Bank and as laid down by the Government under its Decree No. 8 of 1983 concerning Law No. 48 of 1982 issued by the Ministry of irrigation. To avoid fouling of the condenser tube surfaces with marine organisms, the river water prior to circulation through the condensers would be chlorinated. The reaction time for the chlorine in the circulating water flowing through the condensers is adequate to decompose the chlorine so that the residual chlorine content in the circulating water discharged in the river would be well within the Bank guidelines of 0.3 mg/liter. About half of (2 to 5 m³ per minute) the water required for the boiler make-up, plant services and the colony is used up while the balance, 1 to 2.5 m³ per minute, is discharged into the river after being processed through the waste treatment system. The service water, potable water and boiler make-up water would be appropriately treated. The wastewater from the plant would be processed in the wastewater treatment system, and the impurities in the treated and clarified effluent would be within the limits stipulated by the Bank guidelines.

4.34 Stack Emissions - NO_x, SO_x and Particulate. The basic stack emission standards relate to nitrogen oxides (NO_x), sulphur oxides (SO_x) and particulate (dust). The boilers would be dual fuel-fired (natural gas and fuel oil) and would be provided with appropriate NO_x control equipment. The boilers would be provided with individual 126 m tall stack. The environmental assessment indicates that with proper NO_x measures being taken during the boiler design and drafting of the bid specifications for boilers, it is possible to burn fuel oil or natural gas alone in the boilers without exceeding the Bank stipulated NO_x limits of 86 nanograms/joule for natural gas and 130 nanograms/joule for fuel oil. As regards SO_x limitations, burning natural gas in the boiler poses no problem; however, to be within the stipulated limits for SO_x emissions, sulphur content in the fuel oil should not exceed 3.3 percent. Normally, the sulphur content of fuel oil in Egypt is about 2.5 percent and the Bank stipulation regarding SO_x emissions of 500 mt/day for unpolluted areas like Kureimat plant site would not pose any problem. As regards particulate emissions, burning of 100 percent natural gas in the boilers does not pose any problem; however, burning of 100 percent fuel oil in the boilers would result in particulate emissions (comprising fuel ash, fuel additives, acid mist, unburned carbon and soot) of about 252 mg/Nm³ and would exceed the Bank guidelines of 150 mg/Nm³ for the Kureimat plant site located in rural area with a low level of background dust pollution. Therefore, to keep the particulate emissions from the stacks within limits, at least 40 percent or more of the fuel used in boilers in the power station should be natural gas and the balance of 60 percent or less being fuel oil with a maximum sulphur content of 2.5 percent. Taking into account likely

variation of sulphur in fuel oil supplied for the power station, EGPC has assured EEA that it would supply natural gas to the Kureimat power station to cover 50 percent of the fuel requirement, of about 3 million m³ per day, for the lifetime of the Kureimat power station. During negotiations, the Egyptian delegation agreed to incorporate a clause in the subsidiary loan agreement (para. 4.12) to be signed by EEA with EGPC, requiring EGPC to supply natural gas to the power station to cover at least 50 percent of the fuel requirements, estimated at 3 million m³ per day, for the lifetime of the power station. In addition, during negotiations, assurances were obtained from EEA that it would keep adequate space (during boiler design) for installation of particulate collecting devices such as electrostatic precipitators which would be needed for compliance with the environmental standards, in case due to circumstances beyond the control of EGPC, adequate quantities of natural gas may not be available for the power station in future.

4.35 Ambient Air Quality and Noise Pollution. A mathematical dispersion model was used to predict the potential air quality impact of Kureimat power station stack emissions. The results indicate that even under the worst-case scenario of burning fuel oil to cover 100 percent fuel required for the power station, the NO_x, SO_x and particulate standards of the Bank, the Ministry of Health and the United States Environmental Protection Agency are fully complied with (para. 8 of Annex 4.7). Noise pollution from the project would originate from the construction activities and activities during operation and maintenance of the power station. The greatest impact of noise pollution would be on the nearest village of Mimone situated about one kilometer from the power station site. Agreement was reached with EEA that during the engineering design stage care would be taken to ensure that the power station equipment meets the Bank's guidelines for acceptable noise levels in the power station. Further, the bid documents would stipulate conditions requiring successful contractor to abide by the Bank's guidelines for noise pollution while using construction equipment. In addition, the bid documents would stipulate conditions regarding control of dust, and disposal of waste and debris generated during the construction period. During negotiations, EEA assured that it would take adequate measures during design, construction and operation of the power plant to ensure compliance with the environmental standards regarding stack emissions, ambient air quality, water quality, effluent treatment, discharge of water in the river and noise pollution at the Kureimat power station site.

4.36 Gas Pipeline and Transmission Line Corridors, and Use of PCB. An environmental screening of the natural gas pipeline and the transmission line routes found that the corridors are environmentally acceptable. Agreement was reached with EEA that, during installation of the gas pipeline and the transmission lines, it would keep to the minimum adverse impact on agricultural lands and other land resources. The Bank prohibits use of polychlorinated biphenyls (PCB) in the Bank-funded projects and requires that the borrower takes appropriate care during handling, dismantling and disposal of old substation equipment that may contain PCB. During negotiations, EEA agreed to comply with these requirements, and would take special care to stipulate these requirements in the bid documents for procurement of equipment

for rehabilitation of Tanta substation, transmission lines and capacitors for reduction of transmission line losses.

4.37 Environmental Management Unit (EMU). During negotiations, agreement was reached with EEA for the establishment of EMU as an integral part of the power station organization. The main duties and responsibilities of the unit would be to design, implement and monitor: (i) an environmental management plan including an emergency/contingency plan; (ii) a water and air monitoring program; and (iii) a health and hazard safety plan. The unit would be operational during preconstruction and construction phases and during operation of the power station. In addition to the training provided by the vendors of the environmental monitoring equipment and by the engineering consultants responsible for taking measurements of background pollution at the power station site (para. 4.23), USAID would be providing funding for training of the unit personnel. In addition, during negotiations, EEA agreed to establish EMU no later than December 31, 1992, so as to be operational during the pre-construction phase of the power station and would continue to maintain EMU during the life of the project. EEA would furnish to the Bank, for its review, semi-annual progress reports regarding the establishment and activities of the EMU.

M. Women in Development

4.38 EEA encourages participation of women in the activities of the power subsectors. The participation of women in the power subsector activities is more in the urban areas than in the rural areas where social and cultural influences limit their participation in the developmental activities. Thus, out of the total staff of about 37,000 in FY90 about 12 percent were women. However, if we compare the staff at EEA headquarters, out of a total staff positions of about 4,200, about 38 percent were women. Figure 4.1 gives the distribution of EEA headquarter staff by sex and by categories. It is seen that about 40 percent of the technical positions at the headquarters were occupied by women and at clerical level about 74 percent of the positions were filled in by women. It is hoped that in future, with the economical and social developments in the rural areas in Egypt, rural women would also have an important role in the development of the power subsector in the country.

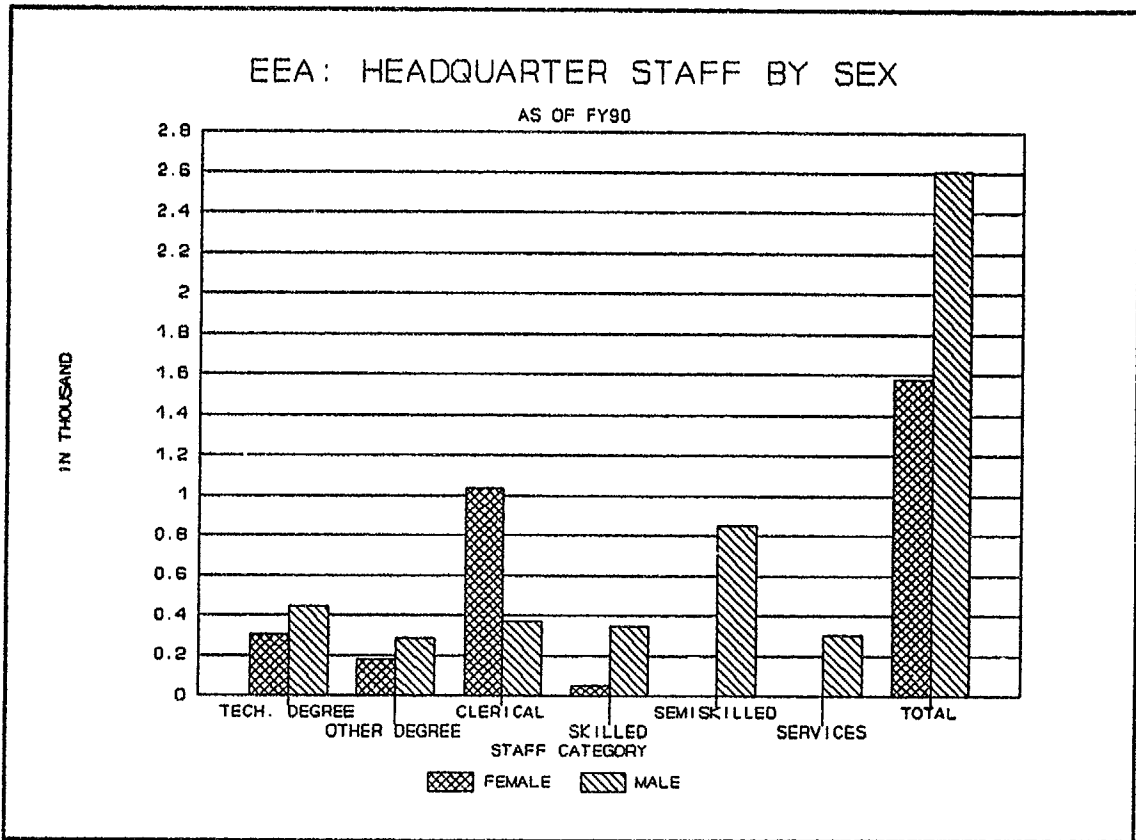


Figure 4.1

N. Risks

4.39 There are no major risks associated with the project. Delays in project implementation would have an adverse impact on the rate of return on investment. The risk of project cost overruns is minimized since the project cost estimates (including price contingencies) are spread over a period of eight years, even though a similar project could be completed in five years. Further, to reduce the risk of project implementation delays, the project includes engineering consultancy services to assist EEA in procurement, installation and commissioning activities under the project. To ensure that the pollution from the power station is within the acceptable limits, the subsidiary loan agreement to be signed by EEA with EGPC would include a clause requiring EGPC to provide adequate quantities of natural gas cover at least 50 percent of the fuel requirement, estimated at 3 million m³ per day, for the lifetime of the power station (para. 4.34). Further, EEA has agreed that in the design of the boilers, adequate space would be kept for the installation of particulate collecting devices to comply with environmental standards in case EGPC is unable to supply the required quantity of natural gas to the power station. In addition, the engineering consultants (to be appointed by the end of March 1992) have been asked to provide equipment and services for timely commencement of background pollution measurements at the site (para.

4.23). Further, to monitor the environmental matters, EEA has agreed to establish an EMU at site (para. 4.37). EEA is familiar with the technology used in the project and has 300 MW units in operation in the system since 1985. To ensure smooth introduction of the unit size of 600 MW (being introduced for the first time) in the system, provision would be made in the contracts of equipment suppliers to provide for offshore and onshore training to EEA's staff that would operate the power station.

0. Project Action Plan

4.40 During appraisal agreement was reached on the principal implementation arrangements, as described above, to ensure efficient implementation of project and environmental management activities. During negotiations, agreement was reached with EEA on an action plan, satisfactory to the Bank, for timely completion of such activities. The following paragraph summarizes the key actions included in the Action Plan.

4.41 Project Action Plan. During negotiations, agreement was reached with EEA that it would take the following measures in a timely manner to implement the project and achieve its objectives:

(a) EEA would continue to employ engineering consultants throughout the project implementation period for the activities related to the Kureimat power station, and the 500-kV transmission lines interconnecting the power station to the electrical system (para. 4.23);

(b) EEA shall cause the engineering consultant (scheduled to be appointed by the end of March 1992) to: (i) install the pollution monitoring equipment and start background pollution measurement by March 1993; (ii) furnish to the Bank, starting October 1993, semi-annual reports on background pollution at the power station site; and (iii) furnish to the Bank the final report on background pollution by March 1994 (para. 4.23);

(c) EEA would ensure, during engineering design of steam generators, that adequate space is provided to for installation of particulate collecting devices at a later date if required (para. 4.34);

(d) EEA would ensure that adequate measures are taken during design, construction, operation and maintenance of equipment at the power station to comply with the environmental standards regarding stack emissions, ambient air quality, water quality, effluent treatment and discharge of water in the river and noise pollution at the Kureimat power station site (para. 4.35);

(e) EEA would ensure that the equipment procured for the transmission lines and substations component of the project does not use PCB and the contractor/EEA staff would take appropriate care regarding handling, dismantling and disposal of old sub-station equipment that may contain PCB (para. 4.36);

(f) EEA would establish, not later than December 31, 1992, EMU as an integral part of the power station and that the unit would be operational during the life of the power station beginning with the pre-construction phase. EEA would also assure that progress reports covering the EMU activities are prepared and furnished to the Bank at six-monthly intervals (para. 4.37); and

(g) EEA would maintain adequate records and reports necessary to monitor the progress of the project and would submit to the Bank monthly and semi-annual progress reports in a form satisfactory to the Bank (para. 4.29).

V. FINANCE - EEA

A. Accounting and Management Information Systems

5.01 EEA financial, cost and management accounting systems fulfill their role of recording, summarizing and communicating financial data reasonably well. Further, the systems incorporate, at the minimum, internal control features which are essential to ensure the integrity of financial data and to facilitate the safeguarding of the utility's assets. Overall the systems are reasonably satisfactory in comparison to utilities of similar size in other developing countries, although some deficiencies do exist, particularly with regard to the preparation of management reports, cost accounting, and financial planning and budgeting. EEA has initiated actions to improve: (a) management reporting through improvement of supporting information systems; and (b) financial planning and budgeting through training of its staff and acquisition of computers and computerization of some of its accounting functions. Thus, under the UNDP Electricity and Data Bank Project, whose primary focus is to strengthen the power subsector's capacity to plan and manage its operations on the basis of accurate, relevant and timely data, EEA manual cost accounting system was to be re-analyzed, modified in the light of identified management needs and computerized. Financial planning software and training in its use was to be provided to EEA staff. However, EEA manual cost accounting system was partially computerized (extent of computerization varies among zones) without any evaluation of its relevance and without any modifications. Financial forecasting software was provided, but no training was provided and EEA has so far not utilized the software. The Bank also provided financing under Loan 1886-1-EGT for overseas training of 30 mid-level, 10 top-level management staff and 1 trainer. EEA was fully satisfied with the results of this training and has recently concluded another contract for further training (financed under Loan 3103-EGT) of a new group of its managers by the same consultant.

B. Financial Management

5.02 The main outstanding actions required to improve EEA accounting and management systems include: (a) review, analysis and design modification of existing financial and cost accounting systems; and (b) computerization of the redesigned systems and of the loan management system. About US\$1.2 million would be provided under this project to cover the foreign cost of

consultancy services for a thorough review of EEA existing financial and cost accounting systems, modification and computerization of the systems and training of a select group of EEA staff in modern cost analysis techniques and preparation of management reports. The draft terms of reference for the proposed consultancy services are provided in Annex 5.7. Computerization of the loan management system is already under way and is being implemented by EEA staff as part of a Government-wide program to improve the management of external debt. During negotiations, assurances were obtained from EEA that it would develop and implement a program to modify and computerize its cost and financial accounting systems by December 31, 1994.

C. Auditing

5.03 EEA financial statements are audited by the Central Organization for Auditing and Control (COAC). The auditing procedures are comprehensive and generally acceptable to the Bank. In the past, submission of audited financial statements to EEA Board of Directors and to the Bank (including proforma consolidated statements of EEA and EDCs) has experienced delays. EEA and the auditors attribute the delays to the volume of work involved and the dispersion of accounting records in the zones and the Head Office relative to the audit manpower available. A more important reason, however, lies in the transaction-oriented approaches employed by the auditors with their emphasis on verification of individual transactions instead of more modern audit approaches which place more reliance on internal controls and statistical analyses. COAC has informed the Bank that it is embarking on new training programs for its staff which would enable COAC to adopt modern audit techniques and thus improve its rate of audits completion. COAC considers that it has adequate resources to implement these programs and that with their completion, it would have both adequate capacity and expertise to handle its workload without the need to subcontract (as suggested by the mission) a part of it to private sector auditors. During processing of this project, a more formalized audit planning process was agreed for FY91. As a result EEA audited financial statements, including proforma consolidated statements of EEA and EDCs, for FY91 were submitted to the Bank by the due date of December 31, 1991. Further, during negotiations, assurances were obtained from EEA that in future years these reports would be submitted to the Bank within six months of the end of each fiscal year.

D. Insurance

5.04 EEA insures through a Government-owned corporation to cover such risks normally covered by the Government and public utilities in Egypt, e.g., motor vehicles, materials and stores. However, EEA does not provide insurance coverage against business risks normally covered by public utilities in other countries, e.g., fire and machinery breakdown. It is necessary for EEA to safeguard its assets, particularly the major generation assets against these types of risks. For this purpose, EEA has agreed, with financing provided under the Fourth Power Project (Loan 3103-EGT), to identify and quantify the risks associated with its operations and to recommend the most appropriate methods consistent with industry practice for minimizing and managing such risks. EEA is currently in the process of obtaining offers from prospective

consultants for the insurance study. It was agreed, during negotiations, that following completion of this study by December 31, 1992, and based on its recommendations, EEA would gradually provide insurance coverage for its assets, so as to ensure completion of the required coverage by June 30, 1996.

E. Recent and Present Financial Performance

5.05 EEA past financial performance (FY85 through FY90) is provided in detailed financial statements provided in Annexes 5.1 through 5.6. The principal features, trends and causes of EEA financial performance during this period are summarized below.

5.06 A number of primary profitability indicators which summarize EEA recent and current financial performance are provided in Figure 5.1 below. Annex 5.5 provides more detailed financial performance indicators. These indicators are the net profit margin (NPM) arrived at after accounting for all expenses including interest - net income as a percentage of sales revenue, net profit margin before interest (NPBI), return on net worth (RNW), return on fixed historical assets (RFA) and return on total historical assets (RTA). The trend of these ratios over the years rather than their absolute values does provide some indication of EEA profitability. The NPM is used here to capture the operational efficiency of EEA investment, production, procurement, pricing and financing decisions in one measure. The NPBI is used to assess the operational efficiency of EEA and all other decisions with the exception of the financing decision. The RNW, RFA and RTA are used to confirm the findings derived from the NPM and NPBI analysis.

Egyptian Electricity Authority Primary Profitability Indicators (In Percentages)					
	NPM	NPBI	RNW	RFA	RTA
FY85	3.5	17.9	1.1	2.0	1.8
FY86	1.8	17.8	0.8	2.4	2.1
FY87	2.5	24.8	1.2	3.5	2.9
FY88	1.8	25.1	1.2	2.7	2.4
FY89	2.8	22.8	2.1	2.3	2.1
FY90	2.1	25.1	1.1	2.9	2.5

Figure 5.1

5.07 Four of the indicators, the NPM, the RNW, the RFA and the RTA clearly show that EEA overall profit performance during the past six years remained broadly unchanged despite the tariff and fuel price increases that

were implemented in this period. The other indicator, the NPBI, suggests that there was an improvement in the operational efficiency, mainly due to increases in electricity prices (para. 5.08). However, as indicated by the NPM indicator, the impact on overall profit performance was reduced by the increases in interest expenses (para. 5.11). Further, the NPBI indicates that some marginal gains did occur in terms of the total returns accruing to EEA long-term stakeholders (shareholders and lenders). Thus, the NPBI increased from 17.9 percent in FY85 to 25.1 percent in FY90. Since the RNW indicates that there was no substantial gains made by the shareholders, all the gains must have accrued to the long-term lenders in the form of higher interest payments. Indeed interest as a percentage of income increased from 14.6 percent in FY85 to 23.0 percent in FY90 (Figure 5.5 and para. 5.11).

5.08 The improvement in operational efficiency indicated by the NPBI ratio during FY85-90 was attributable to an annual increase of about 22.7 percent in the average price of a kWh of electricity (Annex 5.4) compared to an annual increase of about 17.1 percent in the average unit cost of producing and supplying a kWh of electricity to the consumer (Figure 5.2). The increases in the average price of electricity were principally (since changes in sales mix were minimal) due to implementation of tariff increases during FY86-90¹. The increases in the average unit cost of producing and supplying electricity were mainly because of increases in fuel oil and diesel oil prices during the same period². The non-fuel cost component of the average unit cost of producing and supplying electricity increased by about 14.9 percent per year during the same period.

1/ The FY86 tariff and fuel price increases were implemented at the beginning of the fiscal year, whereas the increases for subsequent years were made effective about two months before the end of the relevant fiscal year.

2/ Although no increases in fuel prices took place in FY88, unit fuel costs increased significantly in that year (Figure 5.2) reflecting the reduction in energy generated from hydropower stations (because of low water level in the Nile river) and the high proportion of thermal generation in total generated energy.

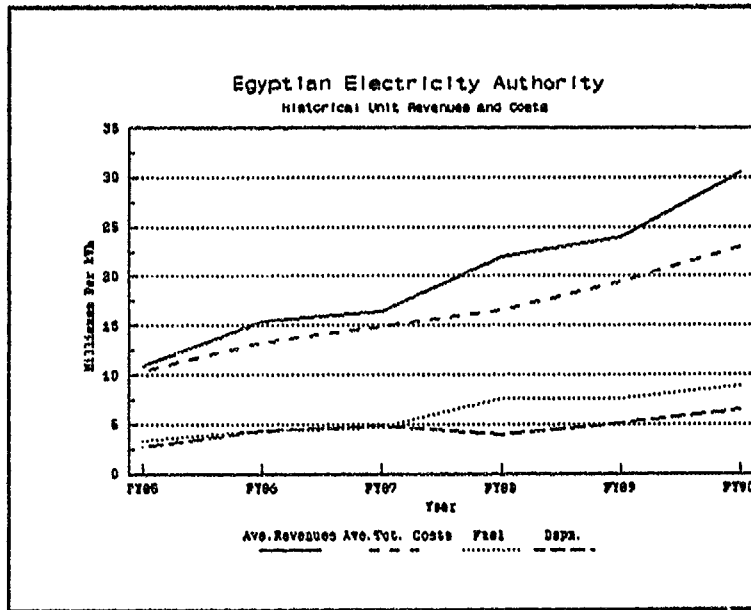


Figure 5.2

5.09 However, despite the improvement in operational efficiency noted above, the improvement in NPBI was not adequate to enable: (a) EEA and EDCs to achieve a modest 5 percent rate of return on revalued assets as agreed with the Bank under Loan 1886-EGT; (b) cover its debt service; and (c) contribute sufficient cash from internal operations to finance the local cost portion of its investment program.

5.10 The actual subsector rates of return on revalued assets were negative in FY85, 1 percent in FY86 and 1.6 percent in FY88.¹ EEA rates of return even on historical assets were quite low as indicated in Figure 5.1 above and in Figure 5.3 below. That these rates of return were too low is also confirmed by the fact that since FY86, EEA has not been able to fully service its debts from internal cash generation (Figure 5.3 and Annex 5.3). Its self-financing ratios (SFRs) were, therefore, negative since during the period FY86-90 as shown in Figure 5.3.

1/ The rate of return covenant was replaced, under the Fourth Power Project (Credit 3103-EGT) appraised in April/May 1989, by a requirement for EEA to achieve self-financing ratios of 20 percent in FY92, 30 percent in FY93 and 35 percent in FY94 and all subsequent years.

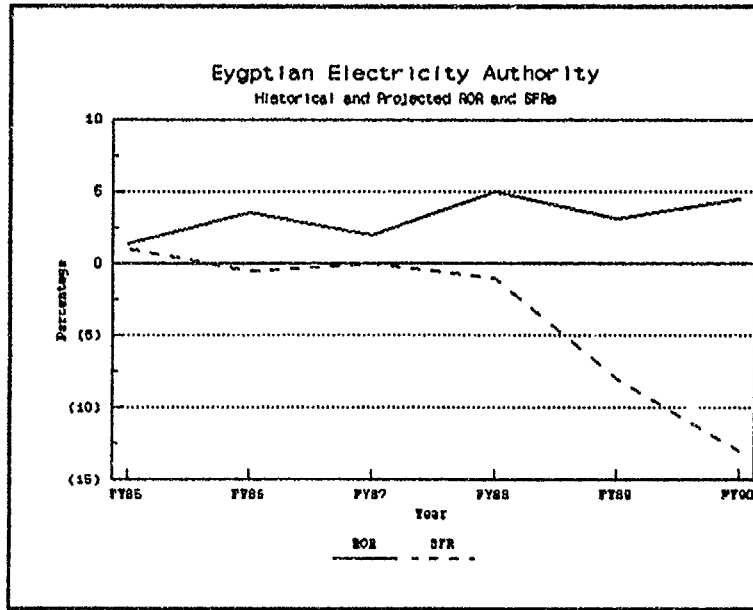


Figure 5.3

5.11 The problem of servicing debts was worsened by the increasing amount of debt falling due for repayment as the grace periods for major construction debts expired and by increases in the exchange rate. The rapid escalation in EEA long-term debt, particularly the component denominated in foreign currency during FY85 through FY90 is illustrated in Figure 5.4. Figure 5.5 shows the increasing interest expenses which explain the reduction in EEA net profit margin (NPM) from 3.5 percent in FY85 to 2.1 percent in FY90 whereas the NPBI increased during the same period (para. 5.07). The total debt service increases are also shown in Figure 5.5.

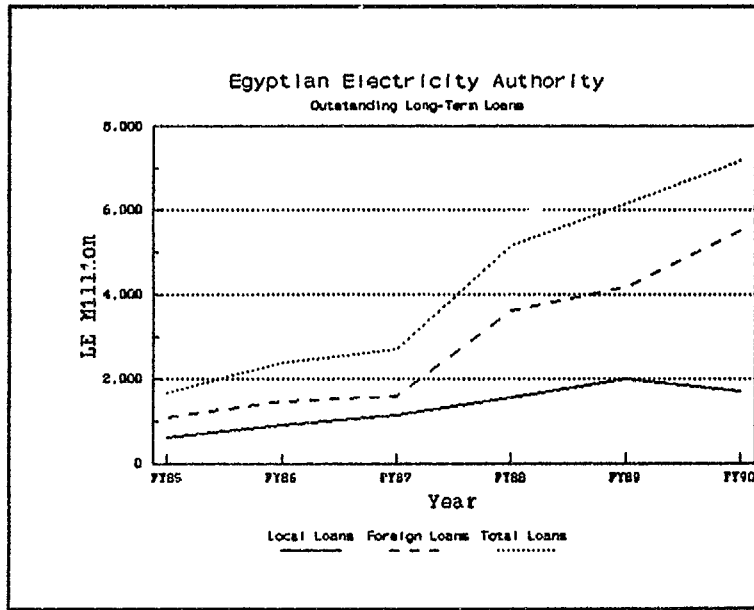


Figure 5.4

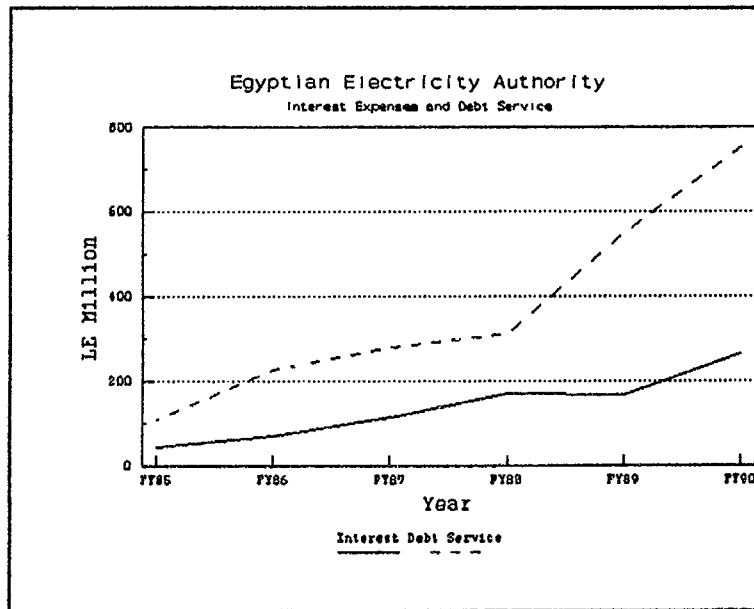


Figure 5.5

5.12 A major problem which has contributed to EEA liquidity problems is the difficult in collecting cash for electricity sales from consumers on a timely basis. Up to FY85 EEA made substantial gains in improving the rate of collecting cash due from consumers for electricity sales. Thus in FY85, EEA total receivables represented about 2.9 months sales revenue compared to about

8 months sales revenue in 1979. Since then, however, receivables have accumulated gradually, reflecting, in part, the difficulties faced by industrial and Government consumers in meeting rising electricity bills as tariffs were increased almost every year starting in FY86. This accumulation of arrears is apparent from the growth trend of sales and receivables as shown in Figure 5.6 below. An analysis of the sales and receivables figures for FY90 indicates that EDCs accounted for about 79.4 percent of EEA total sales and 67.5 percent of its outstanding receivables at the year end; large industrial consumers accounted for 18.2 percent of sales and 23.8 percent of receivables and agricultural consumers accounted for 2.4 percent and 8.7 percent of sales and receivables respectively. Thus, relative to their sales contribution (Table 5.1 below), both industrial (mainly public sector companies) and agricultural (irrigation and land reclamation schemes) impose a higher cash flow burden on EEA than the EDCs.

Table 5.1: FY90 SALES AND RECEIVABLES BY CONSUMER GROUP

	<u>Sales</u> (1)	<u>Percent</u> (2)	<u>Receivables</u> (3)	<u>Percent</u> (4)	<u>Differential</u> (2-4)
Industrial	207.5	18.2	127.5	23.8	(5.6)
Agricultural	27.5	2.4	46.7	8.7	(6.3)
EDCs	<u>906.1</u>	<u>79.4</u>	<u>362.2</u>	<u>67.5</u>	<u>11.9</u>
Total	<u>1141.0</u>	<u>100.0</u>	<u>536.4</u>	<u>100</u>	<u>0.0</u>

Note: Figures in columns (1) and (3) are in LE million.

5.13 As a result of persistent efforts by EEA to resolve the arrears problem, the Government agreed to provide about LE 50 million per year for three years starting in FY89 for settling arrears from public sector and Government consumers. This amount was, however, not adequate to bring the accounts of these consumers into a current status and to enable EEA to fully comply with the requirements under the Fourth Power Project (Loan 3103-EGT) to reduce its arrears to no more than three months sales revenue. During appraisal, EEA provided the mission with an action plan for reducing its accounts receivable from 5.6 months, as of June 30, 1991, to about 3 months sales revenue by June 30, 1992. During negotiations EEA progress in implementing its plan during the first half of FY92 was reviewed with the Bank. Further, assurances were obtained, during negotiations, that from the end of FY92 onwards, EEA would ensure that the accounts receivable do not exceed 3 months sales revenue. An action plan for this purpose was agreed (para. 5.24 and Annex 5.6).

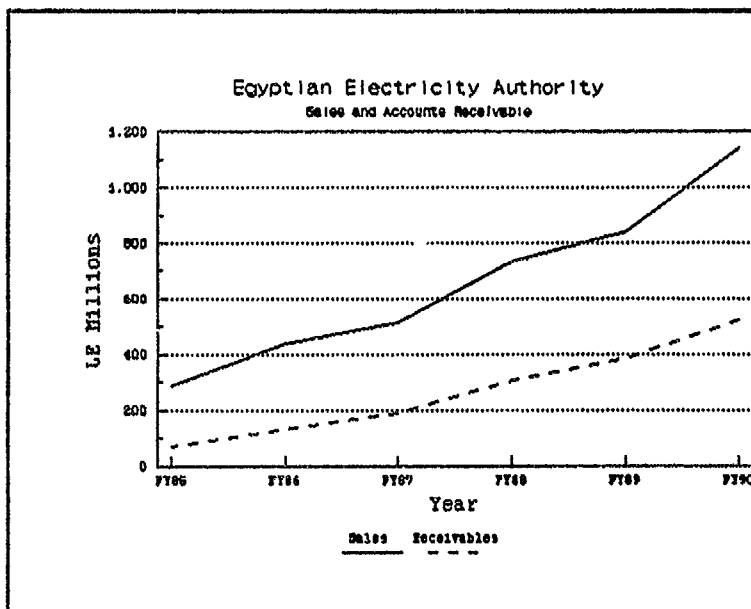


Figure 5.6

F. Future Financial Performance

5.14 **Financial Projections.** EEA financial projections for fiscal years 1991 through 1999 are shown in Annexes 5.1 through 5.6. The underlying assumptions are summarized in paras. 5.15 through 5.19 below and given in detail in Annex 5.6. The principal assumptions on which the financial projections are predicated relate to energy pricing reforms agreed to be implemented by the Government in the context of its Economic Reform and Structural Adjustment Program (ERSAP), expected growth in electricity sales and the size and content of EEA investment program during this period.

5.15 **Energy Pricing Reforms.** The financial projections are predicated on implementation of comprehensive energy pricing reforms aimed at raising the weighted average domestic prices of petroleum products and natural gas to their internationally traded equivalents and electricity prices to cover Long-Run Marginal Costs (LRMC) by June 1995. This will be done by eliminating the difference between the domestic prices existing at the beginning of the ERSAP in 1990 and the target prices by five equal annual percentage point steps for petroleum products, electricity and natural gas. The January 4, 1992 price increase of petroleum products has resulted in the domestic weighted average petroleum products price being 64 percent of the internationally traded equivalent (para. 1.12). The remaining four point steps would require that the weighted average prices of petroleum products should reach 67 percent, 78 percent, 89 percent and 100 percent of internationally traded equivalents by June 30 of each of fiscal years 1992, 1993, 1994 and 1995 respectively. The weighted average electricity price has already been increased to 59 percent of LRMC in May 1991 and would need to be further increased to reach 69 percent,

79 percent, 89 percent and 100 percent of LRMC by June 30 of each of fiscal years 1992 through 1995.

5.16 Fuel Prices. The prices of fuel oil, natural gas and diesel oil used for power generation would be increased together with those of other petroleum products so as to raise the weighted average price to economic levels by FY95. The first step has already been taken in May 1991 by increasing the weighted average price of petroleum products by about 53 percent raising the average price to about 45 percent of the international equivalency and another increase announced in January 1992 brought the average price to about 64 percent of international prices. On the basis of the Bank's projections of crude oil prices, annual prices of the principal fuels used for power generation - heavy fuel oil, diesel oil, and natural gas - were estimated and used for projected future fuel expenses. The assumptions relating to both crude oil and fuel prices are provided in details in Annex 5.6.

5.17 Electricity Prices. At the same time that petroleum products were increased in May 1991, the average electricity price was raised by about 50 percent, bringing it to about 59 percent of LRMC. The remaining four point steps for raising electricity prices to LRMC would be based on the findings of EEA USAID-financed tariff study which is expected to be completed by June 30, 1992. For the purposes of these projections, LRMC estimates were first developed in US cents/kWh for each year up to FY99 and then converted into Egyptian Pounds at the exchange rate of the Pound vis-a-vis the US Dollar. The LRMC estimates were produced on the basis of the latest available estimates of crude oil prices for the fuel cost component and international inflation for the generation cost (including O&M), and the transmission and distribution (including O&M) cost components (Annex 5.6). The system average tariff required to comply with the agreed target for raising the average tariff to LRMC was then determined by applying the percentage targets to the projected LRMC. EEA average tariff was calculated on the assumption that the present practice of determining the internal transfer price for sales to EDCs on the basis of the financial requirements of both EEA and EDCs would continue. This currently shows EEA average tariff at about 65 percent of the system average tariff. Details of these calculations are provided in Annex 5.6.

5.18 Sales and Investment Program. Sales were projected to grow at an average rate of about 5 percent for the period FY92 through FY99 compared to an average annual increase of about 7.4 percent during the previous five years. The slowdown in sales growth is expected because of the impact of price increases on demand as electricity prices are gradually raised to LRMC by FY95, the lack of significant electrification programs to reach new consumers and the modest growth in the economy.

5.19 Conversion of EEA Local Currency Loans into Government Equity. The financial projections are based on the understanding that the Government would convert about LE 1.14 billion of EEA debt to the National Investment Bank (a wholly Government-owned Bank) into equity. During negotiations, agreement was reached with the Egyptian delegation that the conversion of

about LE 1.14 billion EEA debt into equity, shall be a condition of loan effectiveness. The Government has informed the Bank on January 21, 1992, that the Government has already approved the conversion of about LE 1.14 million into equity effective July 1, 1992. Implementation of this action would be a condition of loan effectiveness.

Projected Financial Results

5.20 Profitability. EEA unit sales volume is expected to grow at an annual rate of 5.1 percent during FY91 through FY99. During the same period the average revenue per unit sold is projected to increase by about 22.4 percent per annum from 30.54 milliemes/kWh to 188.70 milliemes per kWh as a result of the expected adjustment of electricity prices to reach the LRMC level by FY95, and their maintenance in real terms thereafter. In 1990, about 29.1 percent of the average revenue per unit of electricity sold was used to cover fuel expenses, 45.9 percent to cover non-fuel operating costs, 23.0 percent to meet interest expenses and the balance was profit. With the planned adjustment of fuel prices to internationally traded equivalents by 1995, the fuel cost per unit sold would rise at an average annual rate of about 29.5 percent per year between FY90 and FY99. Including the non-fuel costs and interest expenses, the total expenses would increase at an average annual rate of about 20.7 percent compared to about 22.4 percent increase in the average revenue per unit sold. Thus EEA profitability would improve.

5.21 Self-Financing Performance. At the same time, however, EEA gross fixed assets are expected to increase from about LE 8,472 million in FY90 to about LE 40,833 million in FY99, an average annual growth rate of about 19.1 percent. The corresponding capital expenditures (FY91-FY99) including balances in work in progress at the end of the period would be about LE 40,872 million. EEA surpluses (adjusted for depreciation and debt service) would finance about 28 percent of the capital expenditure program. The surpluses would, thus, for the period as a whole, exceed the levels required to finance the local cost portion (about 17.6 percent) of the capital expenditures program. The self-financing ratios for each year calculated as a proportion of the year's surplus to the average capital expenditures for three years (previous, current and next year) are expected to be -8 percent in FY91, 22 percent in FY92, 30 percent in FY93, and range between 36 and 39 percent during FY94 through FY99.

5.22 Debt Service Coverage. EEA annual debt service requirements would increase from about LE 752 million in FY90 to about LE 2,231 million in FY99, an increase of about 12.8 percent per year. EEA debt service capacity as measured by debt service ratios (profits plus depreciation as a proportion of debt service payments) would be strong from FY92 onwards. The debt service ratios (DSRs) are projected to vary between 1.96 to 2.2 during FY93 through FY99.

G. Financial Covenants

5.23 Principal Financial Objectives to be pursued by EEA under this project would be similar to those agreed under the Fourth Power Project and

are defined in terms of: (i) the self-financing or internal cash generation ratio; (ii) the debt servicing ratio; (iii) the number of months' sales represented in accounts receivable; (iv) the submission of audited financial statements of EEA and proforma consolidated statements for the subsector (EEA and EDCs) within six months of the end of each fiscal year; and (v) implementation of adequate insurance arrangements in accordance with industry practice. In addition, to strengthen EEA ability to achieve indicators (i) through (iv), EEA agreed to implement improvements in its financial and cost accounting systems with financing provided under the technical assistance component of this project. These principal financial objectives and some of the key measures to accomplish them were agreed during the negotiations.

5.24 During negotiations, assurances were obtained from EEA that it would take all measures needed to achieve the following financial performance targets:

(a) ensure appropriate modification and computerization of its financial and cost accounting systems by December 31, 1994 with a view to providing management with a tool to analyze the financial performance of its operating units and control operating costs (para. 5.02);

(b) implement its action plan (as detailed in Annex 5.6) on a continuous basis with the objective of reducing and maintaining its accounts receivable at levels no more than three months sales revenue from the end of FY92 onwards (para 5.13);

(c) self-financing ratios of 20 percent in FY92, 30 percent in FY93, and 35 percent in FY94 and all subsequent years (para. 5.21);

(d) debt service ratios of at least 1.5 times in each year, failing which it would not contract new long-term debt without the Bank's prior concurrence (para. 5.22); and

(e) complete its insurance study being financed under the Fourth Power Project (Loan 3103-EGT) by December 31, 1992 and gradually provide insurance coverage for its assets, so as to ensure full coverage for the required assets by June 30, 1996 (para. 5.04).

5.25 During negotiations, assurances were also obtained from EEA that it would submit to the Bank its audited financial statements and proforma consolidated accounts of the power subsector (EEA and EDCs) within six months of the end of each fiscal year (para. 5.03).

H. Investment Plan and Financing Sources

5.26 The table below summarizes EEA projected financing plan during FY91 through FY99.

	<u>LE Million</u>	<u>Percent</u>
<u>Investment Expenditures</u>		
Project Expenditures	5,090	9.98
Other Capital Expenditures	35,782 ^{1/}	70.15
Working Capital	<u>10,138</u>	<u>19.87</u>
Total Investment Expenditures	<u>51,010</u>	<u>100.00</u>
Financed As Follows:		
<u>Funds from Internal Operations</u>		
Net Income Before Interest	19,435	
Add Bank: Depreciation	7,027	
Gross Funds from Internal Operations	26,462	
Less Debt Service	12,181	
Net Funds from Internal Operations	14,281	28.00
<u>External Project Loans</u>		
IBRD	1,064	2.09
African Development Bank	1,695	3.32
Arab Fund	602	1.18
USAID	970	1.90
Saudi Govt. Grant for Project	243	.47
Other Loans	30,558	59.91
Other Grants	<u>1,597</u>	<u>3.13</u>
Total Sources	<u>51,010</u>	<u>100.00</u>

^{1/} Includes interest during construction incurred on the total investment program including on the project.

5.27 EEA investment program for FY91-FY99 total about LE 51,010 million of which LE 42,032 or about 82 percent represents foreign costs. The balance of the investment program, LE 8,978 million would be financed by cash generated from internal operations except during FY91 when local loans were used to finance local expenditures. Funds generated from internal operations are expected to amount to about 28 percent of EEA investment requirements during FY91-99. The foreign currency costs are expected to be financed from a combination of foreign loans, (including suppliers credits) and grants as indicated in the above table. A detailed financing plan on a year-by-year basis is provided in Annex 5.3.

VI. FINANCE - EGPC

Introduction

6.01 This section contains the Bank's assessment of the financial viability of EGPC which is to be a recipient of about US\$41.2 million of the proceeds of the Bank loan to be on-lent by EEA for the procurement of materials and equipment required to construct the gas pipeline (para. 4.09). A complete financial viability assessment of EGPC was recently carried out under the Gas Investment Loan approved by the Board on June 21, 1991. The results of that assessment have been updated to incorporate the impact of changes in crude oil prices since the appraisal of the Gas Investment Loan.

These changes do not materially alter the conclusion that EGPC is expected to remain financially viable during the period up to 1997. Financial viability of EGPC will be monitored through debt service coverage ratio and financial reporting (including audit) covenants agreed under the Gas Investment Loan. It is therefore proposed not to seek further financial conditionalities under this operation. The financial viability assessment carried out under Loan 3354-EGT as updated by the mission is given below.

6.02 The financial organization of the gas subsector is essentially that of a single profit center (EGPC) with numerous functional subsidiaries, which operate on a cost basis. EGPC acts as the financial coordinator and implicitly sets transfer prices between subsidiaries (functions), which cover costs (including depreciation) plus commission.

Historic Financial Performance of EGPC

6.03 The financial performance of EGPC has been historically secure due to the fact that, as the Government's rent collector in the petroleum subsector, EGPC has low costs relative to revenues. EGPC has little debt (US\$300 million as of June 30, 1990 or less than 10 percent of long-term capital) as cash flow has been generally sufficient to cover investment requirements (Table 6.1 outlines past EGPC performance, with details in Annexes). EGPC financial performance depends primarily on two factors: international and domestic energy prices and the costs of production under concession agreements. Traditional indicators of financial performance are generally misleading because EGPC acts as rent collector; as such returns self-financing levels and debt service coverage ratios are all very high. Nevertheless, EGPC has experienced deteriorating profit levels over the past six years (net profit margin fell to 21 percent in FY90 from 39 percent in FY85) largely due to declining crude oil prices.

6.04 These conditions, compounded by the anticipated decline in oil production levels and the rising cost of gas supply (which are payable in foreign currency) could result in a net loss in the EGPC foreign currency account during the next decade. The two avenues EGPC has to control these problems are to increase domestic product prices (to increase revenues and reduce demand) and to expand gas supply to substitute for exportable petroleum products.

Table 6.1: HISTORIC EGPC INCOME AND CASH FLOW

Fiscal year Ending June 30	1985	1986	1987	1988	Prelim.	
					1989	1990
(LE Million)						
Net export revenues	1,454	831	876	1,033	962	1,300
percent of total						
Total revenues	3,350	3,088	3,100	3,935	4,089	4,564
Operating expenses	2,032	1,976	2,007	2,648	2,955	3,590
Net profit	1,318	1,112	1,093	1,287	1,134	974
percent	39%	36%	35%	33%	28%	21%
Internal funds	1,833	1,606	1,604	1,847	1,608	1,489
Taxes & profit distr.	81%	83%	76%	77%	74%	75%
Net internal sources	355	273	387	419	412	368
External sources	64	78	66	45	8	n.a.
Debt service	15	22	30	67	64	76
Investments	478	299	167	402	176	268
Self-financing %	44%	129%	108%	107%	162%	104%

1/ Export revenues at petroleum sector exchange rate.

2/ In all years, debt service coverage by internal funds exceeds 100 percent.

3/ The ratio of internal funds after surplus disposition, taxes, debt service and working capital changes to three-year moving average capital expenditures.

6.05 As a result of the energy price reform program, high export prices of crude oil in FY91 and increases in the supply of natural gas, EGPC financial position has improved substantially. This improvement has resulted in increased transfers from EGPC to the government budget of about LE 2 billion in FY91 and is forecast to increase by in excess of LE 2 billion in FY92. A similar increase in transfer to the government's budget is forecast for FY93 largely due to the energy price reform program. The domestic energy price increases and increased gas supply would continue to have a considerable impact on the government budget.

Accounts and Audit

6.06 EGPC accounts are subject to an annual external audit by the Central Audit Organization. Aside from documentary audits this review is effected in collaboration with the Ministry of Finance to ensure that expenditures are in accordance with authorized budget amounts. Under the Gas Investment Loan, EGPC agreed to have its financial statements audited by independent auditors acceptable to the Bank and to supply such statements to the bank within six months of the end of each fiscal year. EGPC also agreed to maintain a debt service coverage ratio of at least 1.5. The government, as guarantor, agreed to take all necessary measures to enable EGPC to comply with these financial objectives.

VII. PROJECT JUSTIFICATION

7.01 The project is an integral part of EEA least-cost investment plan for FY92-99 and would assist EEA in efficiently meeting the future demand of electricity. The investment plan (of which the project is an integral part) yields an internal economic rate of return (IERR) of 10 percent.

7.02 Load Forecast. EEA's historical generation and sales data for FY82-91 and estimated data for FY92-99 is given in Annex 2.1. During FY82-91, electricity sales to the end consumers grew at about 9 percent (para. 2.06) and taking into account the forecast for FY92-99 of the macroeconomic situation in the country, the electricity sales to the end consumers are projected to slow down to around 5 percent. With the Government's resolve to increase, by FY95, the weighted average electricity price to reflect LRMC based tariffs, it is estimated that the growth rates for electricity sales to the industrial and domestic consumers (which account for about 80 percent of electricity sales) would decline from 7 percent and 12 percent during FY82-91 to 5 percent and 6 percent for FY92-99.

7.03 Least-Cost Analysis. EEA revised investment plan is based on the revised load forecast reviewed by the mission and was found to be the least-cost solution to meet the future demand for FY92-99. The investment plan also takes into account additional capacity needed for replacement of old generating units (thermal and combustion turbines) of about 750 MW total capacity. As mentioned in para. 4.01, the consultants, S & W, carried out a feasibility study in 1985 and based on the restricted availability of natural gas, revised the study in 1989. After comparing five potential sites from techno-economical and environmental aspects, the consultants concluded that the dual fuel fired power plant of 1,200 MW net capacity was the lowest cost solution to meet the future demand for electricity in FY96-97.

7.04 Rate of Return Analysis. The project is a part of EEA's FY92-99 least-cost investment plan. The IERR was calculated on the required investment program for the incremental sales and demand to be met for FY92-99, and is 10 percent. Measurable costs include: (a) the capital cost of EEA investment plan for FY92-99; (b) operation and maintenance costs; and (c) the fuel cost. The electricity tariffs for FY92-99 reflect the agreement reached with the Government under the SAL. Thereafter, the weighted average electricity tariff is presumed to remain constant during the life of the project. The fuel cost projections, for FY92-99, are based on the agreement reached with the Government under the SAL for energy price increases and thereafter the Bank's current forecast for the prices of petroleum is presumed. Measurable benefits are revenues due to incremental sales for the period FY92-99. Annex 7.1 gives in detail the assumptions in calculation of IERR.

7.05 Sensitivity Analysis. The IERR for the time slice of the EEA investment plan for FY92-99 is at 10 percent since: (i) heavy investment in generation are required to cover the cost replacement of about 750 MW of old generation capacity in addition to the cost involved in providing generation capacity to meet the incremental demand for electricity for FY92-99; (ii) the benefit stream includes only the revenues due to incremental electricity sales and the IERR is more an evaluation of adequacy of electricity tariffs than of

the true economic worth of the investment plan; and (iii) other benefits¹ difficult to quantify are not included. The IERR is within the range typical of other power projects and is in line with that projected under the Fourth Power Project approved by the Board in June 1989. Sensitivity analysis determining the effect of a 20 percent increase in the generation costs over the base case (Alternative I), 20 percent increase in the transmission costs over the base case (Alternative II), 20 percent decrease in revenue earnings compared to the base case (Alternative III) and 20 percent increase in fuel costs over the base case (Alternative IV). The IERR for the four alternatives were:

- Alternative I	about 8 percent
- Alternative II	about 9 percent
- Alternative III	about 5 percent
- Alternative IV	about 8 percent

The analysis indicates that the IERR is most sensitive to changes in the electricity tariffs and is least sensitive to changes in the investments for transmission lines and substations. It is therefore essential that the Government carries out the electricity price increases agreed under the SAL.

VIII. AGREEMENTS REACHED DURING NEGOTIATIONS AND RECOMMENDATIONS

8.01 During negotiations, agreement was reached that the Government as Guarantor of the loan would take all necessary actions to:

- (a) enable EEA and EGPC to cover the financing requirements, including any cost overruns, for the project (para. 4.11);
- (b) enable EEA to reduce its accounts receivable to less than three months of sales revenue (para. 5.13); and
- (c) convert about LE 1.14 billion of EEA debt to the National Investment Bank into equity prior to loan effectiveness (para 5.19).

8.02 During negotiations, assurances were obtained from EEA that it would:

- (a) provide all necessary funds to complete the financing of project costs, including any cost overruns (para. 4.11);

^{1/} For example, while it is generally accepted that the economic value of a shortfall in electric supply is very high (estimates ranging from US\$0.5/kWh to US\$2.0/kWh) there is no rigorous and consistently applicable methodology available for calculating this value. Therefore, it is not possible to determine the true economic benefit on this account. It is estimated that in case of developing countries, an unreliable electric supply could result in a loss of one to five percent of estimated electricity sales. Assumption of a value of US\$0.5/kWh for the shortfall and a figure of one percent for the loss of electricity sales would give an IERR of about 22 percent for the project.

(b) pass on part of the loan proceeds intended for construction of gas pipeline to EGPC and enter into a subsidiary loan agreement, satisfactory to the Bank, for this purpose (para. 4.12);

(c) take all necessary measures to implement a Project Action Plan, satisfactory to the Bank (para. 4.41);

(d) submit its audited financial statements within six months of the end of each fiscal year (para. 5.03); and

(e) take all necessary measures to comply with the financial targets included in para. 5.24.

8.03 The following are proposed as the conditions of loan effectiveness:

(a) EEA to sign with EGPC a subsidiary loan agreement, satisfactory to the Bank, for onlending of Bank funds toward the foreign exchange cost of the supply of materials and equipment for the natural gas pipeline (para. 4.12); and

(b) the Government converting about LE 1.14 billion of EEA local currency debt into equity (para. 5.19).

8.04 Subject to the above, the proposed project is recommended for an IBRD loan of US\$220 million equivalent to EEA at the standard variable interest rate and for a term of 20 years including a 5-year grace period. EEA would onlend to EGPC about US\$41.2 million (required for the natural gas pipeline) for a term of 20 years including a grace period of 5 years.

8.05 Annex 8.1 gives the list of selected documents and data available in the project file.

EGYPT
KUREIMAT POWER PROJECT
Energy Supply and Demand: FY83--FY99
(In Thousand Metric Tons)

	Actual										Projected							
	FY82	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
I. Gross Supply																		
A. Crude Oil																		
1. Production	33,600	35,600	40,400	44,300	40,200	44,200	44,200	44,200	43,500	43,500	43,500	43,500	41,760	40,090	38,486	36,947	35,469	34,050
2. Export (Egypt + Partner)	17,600	17,400	20,700	22,370	22,080	23,916	24,103	23,185	20,445	21,848	21,740	19,728	15,576	13,894	12,297	10,754	9,431	8,144
3. Imports (Incl. Sales by Partner)	600	200	400	0														
4. Gross Supply to the Refineries	16,600	18,400	20,100	21,930	18,120	20,284	20,097	21,015	23,055	21,652	21,760	23,772	26,186	26,196	26,189	26,193	26,038	25,906
B. Natural Gas (in Equivalent Fuel Oil)																		
1. Natural Gas	1,924	2,194	2,729	3,730	4,310	4,930	4,750	5,950	6,710	8,278	8,983	11,736	12,423	12,375	12,329	12,282	14,284	15,598
2. Condensate & LPG from Gas Fields				1,146	1,302	1,466	1,569	1,602	1,489	2,101	2,295	3,525	3,719	3,705	3,732	3,755	4,291	4,670
3. Gross Supply - N. Gas + Condensate + LPG	1,924	2,194	2,729	4,876	5,612	6,396	6,319	7,552	8,199	10,379	11,278	15,261	16,142	16,080	16,061	16,037	18,575	20,268
6. of Which Condensate to Refineries				275	330	380	405	405	495	627	736	950	1,002	998	1,006	1,002	1,156	1,258
C. Hydropower Generation (in Eq. Fuel Oil)																		
1. Generation (GWh)	10,475	10,267	9,637	9,004	9,046	9,105	8,259	9,323	9,972	9,500	9,500	9,500	9,900	9,900	9,900	9,900	9,900	9,900
2. Generation in Eq. Fuel Oil 1/	3,582	3,398	3,048	2,737	2,623	2,568	2,263	2,508	2,603	2,413	2,375	2,337	2,435	2,435	2,426	2,396	2,396	2,376
3. Total Supply for Internal Consumption	22,106	23,992	25,877	29,543	26,355	29,248	28,679	31,075	33,857	34,444	35,413	41,370	44,761	44,711	44,676	44,626	47,009	48,550
II. Production of Petroleum Products																		
1. LPG (Butane Gas)	243	270	379	447	268	284	280	285	41									
2. Gasoline/Naptha	2,091	2,295	2,370	2,635	2,805	3,227	3,380	3,400	3,400	3,400	3,400	3,740	4,114	4,114	4,114	4,114	4,114	4,114
3. Kerosene	1,571	1,953	2,029	2,123	2,318	2,400	2,447	2,530	2,530	2,530	2,530	2,783	3,061	3,061	3,061	3,061	3,061	3,061
4. Jet/Aviation Fuel	175	170	162	132	170	170	170	170	170	170	170	187	206	206	206	206	206	206
5. Gas/Diesel Oil	2,634	2,794	2,851	3,337	3,356	3,747	3,613	3,600	3,600	3,600	3,600	3,960	4,356	4,356	4,356	4,356	4,356	4,356
6. Fuel Oil	7,743	8,699	9,057	9,787	9,976	10,351	10,380	10,450	10,450	10,450	10,450	11,495	12,645	12,645	12,645	12,645	12,645	12,645
7. Asphalt	304	476	531	581	606	584	583	651	651	651	651	716	788	788	788	788	788	788
8. Lube Oil & Others	41	42	115	114	499	493	492	549	549	549	549	605	666	666	666	666	666	666
9. Total II	14,800	16,699	17,494	19,156	19,998	21,256	21,345	21,635	21,391	21,350	21,350	23,486	25,836	25,836	25,836	25,836	25,836	25,836
III. Net Export/(Import) of Petroleum Products																		
1. LPG (Butane Gas)	(207)	(223)	(166)	(145)	(166)	(160)	(79)	28	41									
2. Gasoline/Naptha	728	641	541	661	810	844	1,108	1,270	1,428	1,210	1,178	1,461	1,829	1,810	1,785	1,785	1,785	1,785
3. Kerosene										92	66	1,133	1,483	1,442	1,413	1,413	1,413	1,413
4. Jet/Aviation Fuel																		
5. Gas/Diesel Oil	(584)	(873)	(1,053)	(1,266)	(748)	(622)	(676)	(779)	(774)	(968)	(827)	(208)	414	385	324	324	324	324
6. Fuel Oil	1,928	1,654	1,574	2,257	2,296	2,391	2,014	2,600	2,974	1,535	1,743	3,335	4,792	4,711	4,561	3,831	3,273	2,729
7. Asphalt		16	14															
8. Lube Oil & Others				17	18	25	29	46	51	(25)	(25)	74	184	139	92	82	72	62
9. Total III	1,881	1,213	896	1,524	2,210	2,478	2,396	3,165	3,720	1,844	2,135	5,795	8,702	8,485	8,175	7,435	6,867	6,513

EGYPT

KUREMAT POWER PROJECT

Energy Supply and Demand: FY83-FY99
(In Thousand Metric Tons)

	Actual										Projected								
	FY82	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	
IV. Domestic Availability incl. Changes in stocks																			
1. LPG (Butane Gas)	450	493	545	592	434	444	359	257	0	0	0	0	0	0	0	0	0	0	
2. Gasoline/Naptha	1,363	1,654	1,829	1,974	1,995	2,383	2,272	2,130	1,972	2,190	2,222	2,279	2,285	2,304	2,329	2,329	2,329	2,329	
3. Kerosene	1,571	1,953	2,029	2,125	2,318	2,400	2,447	2,530	2,530	2,438	2,464	1,650	1,578	1,619	1,648	1,648	1,648	1,648	
4. Jet/Aviation Fuel	173	170	162	132	170	170	170	170	170	170	170	187	206	206	206	206	206	206	
5. Gas/Diesel Oil	3,218	3,667	3,904	4,603	4,104	4,369	4,289	4,379	4,374	4,568	4,427	4,168	3,942	3,973	4,032	4,032	4,032	4,032	
6. Fuel Oil	5,815	7,045	7,483	7,530	7,680	7,960	8,366	7,850	7,476	8,915	8,707	8,160	7,853	7,934	8,084	8,814	9,372	9,916	
7. Asphalt	288	462	531	581	606	584	583	651	651	651	651	716	788	788	788	788	788	788	
8. Lube Oil & Others	41	42	115	97	481	468	463	503	498	574	574	531	482	527	576	584	594	604	
9. Total IV	12,919	15,486	16,598	17,632	17,788	18,178	18,949	18,470	17,671	19,506	19,215	17,691	17,134	17,351	17,661	18,401	18,969	19,523	
V. Domestic Commercial Energy Consumption																			
1. LPG (Butane Gas)	450	493	545	596	642	706	759	792	846	847	824	840	852	1,709	1,721	1,715	1,979	2,154	
2. Gasoline/Naptha	1,363	1,654	1,829	1,892	2,001	2,069	2,121	2,096	2,174	2,190	2,222	2,203	2,300	2,363	2,403	2,439	2,476	2,511	
3. Kerosene	1,571	1,953	2,029	2,180	2,269	2,386	2,406	2,422	2,358	2,438	2,464	2,465	2,498	1,624	1,645	1,724	1,521	1,613	
4. Jet/Aviation Fuel	173	170	162	437	364	385	390	390	390	407	425	444	463	484	505	527	551	575	
5. Gas/Diesel Oil	3,218	3,667	3,904	4,175	3,763	3,919	4,087	4,171	4,373	4,568	4,428	4,205	4,052	4,044	4,059	4,221	4,392	4,565	
6. Fuel Oil	5,815	7,045	7,483	7,450	7,171	8,034	8,344	8,056	8,184	8,915	8,707	8,160	7,853	7,934	8,084	8,814	9,372	9,916	
7. Lube Oils and Other Products	329	504	646	1,022	1,198	1,216	1,205	1,226	1,226	1,226	1,226	1,247	1,270	1,315	1,362	1,411	1,462	1,516	
8. Natural Gas	1,770	2,018	2,511	3,522	4,432	5,159	6,067	6,493	7,152	8,147	9,556	12,338	13,015	12,967	13,062	13,015	15,016	16,341	
9. Hydro-Electricity	3,582	3,398	3,048	2,737	2,623	2,568	2,263	2,508	2,603	2,413	2,375	2,337	2,435	2,435	2,426	2,396	2,396	2,376	
10. Total V	18,271	20,902	22,157	24,011	24,463	26,442	27,642	28,154	29,306	31,151	32,227	34,239	34,738	34,875	35,267	36,262	39,165	41,367	
VI. Energy Production, Export and Consumptn. in TOE																			
1. Energy Production	40,599	42,784	48,006	53,868	50,156	55,060	54,693	56,112	56,088	57,999	58,825	62,613	61,724	59,909	58,196	56,527	57,410	57,525	
2. Energy Export	20,311	19,440	22,595	24,955	25,337	27,533	27,673	27,466	25,131	24,781	24,949	26,448	24,944	22,963	20,981	18,648	16,713	14,828	
3. Domestic Gross Energy Availability	20,288	23,344	25,411	28,913	24,819	27,527	27,020	28,646	30,957	33,218	33,876	36,165	36,780	36,946	37,215	37,879	40,697	42,697	
4. Domestic Production of Petroleum products	14,577	16,446	17,233	18,877	19,700	20,958	21,050	21,337	21,078	21,035	21,035	23,140	25,455	25,455	25,455	25,455	25,455	25,455	
5. Export/(Import) of Petroleum Products	1,813	1,153	839	1,444	2,131	2,397	2,341	3,099	3,643	1,819	2,100	5,714	8,574	8,360	8,057	7,346	6,801	6,269	
6. Domestic Availability - Petroleum Products	12,764	15,293	16,394	17,433	17,569	18,561	18,709	18,238	17,435	19,216	18,935	17,426	16,881	17,095	17,398	18,109	18,654	19,186	
7. Domestic Availability- Natural Gas +Cond.	1,867	2,106	2,620	4,417	5,071	5,775	5,677	6,861	7,396	9,362	10,120	13,739	14,534	14,479	14,453	14,434	16,722	18,250	
8. Domestic Availability- Hydropower	3,439	3,262	2,926	2,628	2,518	2,465	2,172	2,408	2,499	2,316	2,280	2,244	2,338	2,338	2,329	2,300	2,300	2,281	
9. Gross Domestic Energy Consumption	18,050	20,661	21,940	24,478	25,158	26,801	26,558	27,507	27,330	30,894	31,335	33,409	33,753	33,912	34,180	34,843	37,676	39,717	
- of which Energy Consumed in Elec. Prodn.	7,223	7,933	8,477	8,794	8,975	9,525	9,967	10,216	10,444	10,891	11,357	11,850	12,483	13,160	13,738	14,032	14,678	15,198	

1/ Hydrogeneration converted to the equivalent fuel oil by using the average fuel rate (gms/kWh) for the year in EEA's power stations.

EGYPT

KUREIMAT POWER PROJECT

Petroleum Product Price Increase Formulation

As agreed, the weighted average domestic petroleum product prices will be increased at least annually to achieve 100% of internationally traded equivalents by June 1995. Interim targets of 45%, 56%, 67%, 78% and 89% by May 1991, December 1991, May 1992, May 1993 and May 1994, respectively were agreed upon. The conversion of local prices to international equivalents will be based on the commercial exchange rate at the time the price increase action is undertaken. Internationally traded equivalents would be based on the most recently published preceding twelve month rolling average of petroleum products FOB Italy and, where necessary, FOB NW Europe as published by Platt's (see details below). On the basis that ex-refinery products should be priced in such a manner to reflect an indifference between the international and domestic markets, transportation costs¹ should be subtracted from international equivalents for all products except for gas oil (for which Egypt is a net importer) and LPG (which has a much higher transport cost). A transport cost will be added to gas oil prices and \$20/ton is for the time being to be subtracted from LPG prices to account for these differences. The focus of future price increases will be to continue to reduce not only the subsidies to the sector, but also the cross-subsidies among products. The product-by-product basis for calculating the internationally traded equivalents of domestic petroleum product prices is as follows:

- (i) Premium Gasoline = Premium Gasoline FOB Italy -
Premium Gasoline FOB NW Europe +
Regular Gasoline FOB NW Europe²
- (ii) Regular Gasoline = Average of Premium Gasoline (above)
and Naphta FOB Italy
- (iii) LPG = LPG FOB Italy
- (iv) Kerosene = Jet Kerosene FOB Italy - \$5/ton³
- (v) Gas Oil = Gas Oil, FOB Italy
- (vi) Fuel Oil = 3.5% sulphur Fuel Oil, FOB Italy
- (vii) Diesel Fuel = 85% Gas Oil + 15% Fuel Oil
- (viii) Bulk Natural Gas = Fuel Oil equivalent (fuel oil + 20%)

1/ At the present time, transportation costs of \$7/ton are based on a conservative estimate of shipping costs from Egypt to southern European markets. Local transportation costs to deliver products to port are assumed to be approximately equal to local transportation costs for domestic sales.

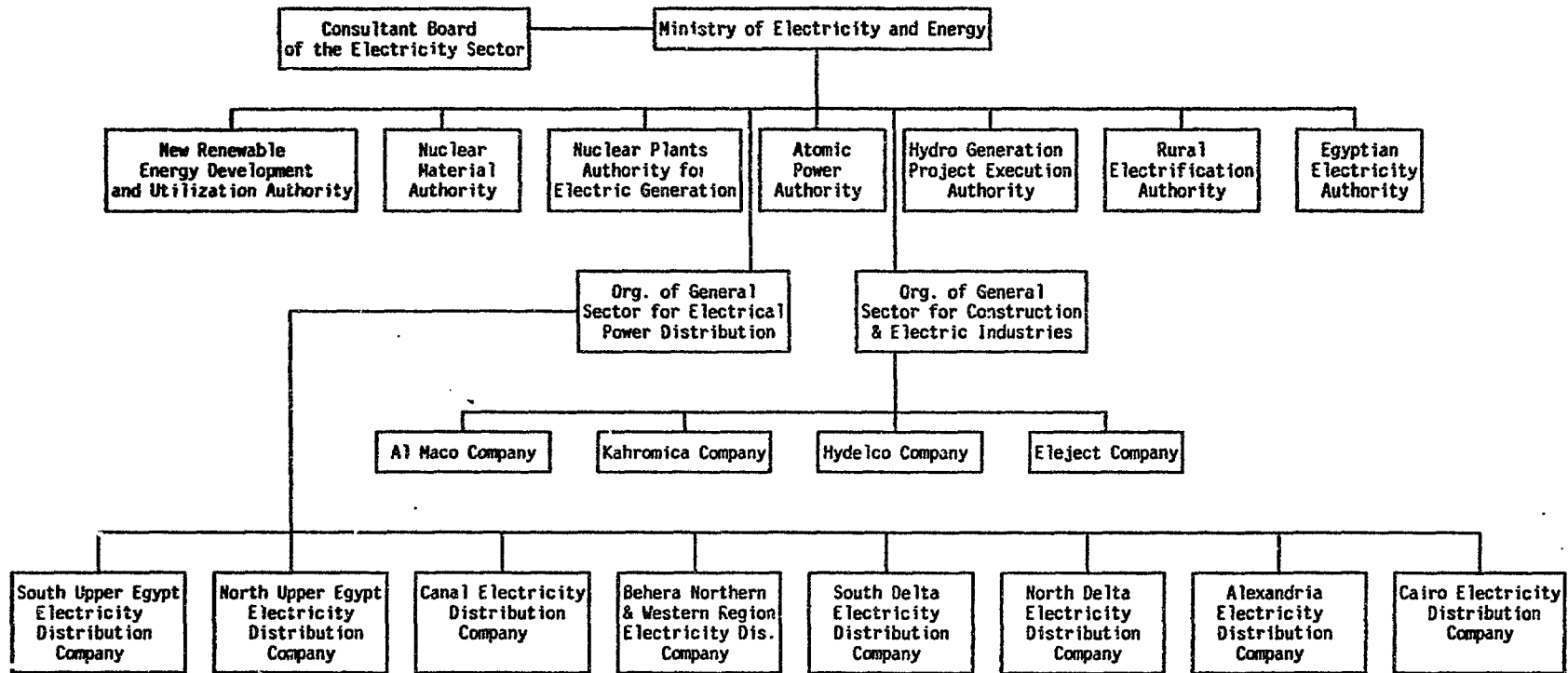
2/ Egyptian premium gasoline is only about 90 Octane, equivalent to European regular. Since regular gasoline FOB Italy is not quoted, the differential between premium gasoline FOB Italy and premium gasoline FOB NW Europe is subtracted from regular gasoline FOB NW Europe to arrive at an equivalent of regular gasoline FOB Italy.

3/ The subtraction of \$5/ton reflects the differential in quality between jet kerosene and regular kerosene.

EGYPT

KUREIMAT POWER PROJECT

Organization Chart for Egypt's Power Subsector



EGYPT
KUREIMAT POWER PROJECT
EEA Generation and Sales

	Actual										Projected							
	FY82	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
I. Installed Generation Capacity (MW)																		
A. Interconnected System																		
(i) Hydro	2,445	2,445	2,445	2,445	2,715	2,715	2,715	2,715	2,715	2,715	2,715	2,715	2,815	2,815	2,815	2,815	2,815	2,815
(ii) Thermal - Steam	1,625	1,925	2,690	3,715	4,290	4,590	4,590	4,905	5,205	5,905	5,815	6,666	7,206	7,206	7,791	8,640	9,228	9,470
(iii) Combustion Turbines (Inc. C.C.)	900	1,271	1,384	1,480	1,592	1,592	1,812	2,412	2,772	3,087	3,041	3,013	3,061	3,116	3,091	3,054	3,014	3,014
Total A	4,970	5,641	6,519	7,640	8,597	8,897	9,117	10,032	10,692	11,707	11,571	12,394	13,082	13,137	13,697	14,509	15,057	15,299
B. Isolated System	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	119	119	119	119	225	225	225	225	194	174	174
Total Installed Capacity (A+B)	6,970	5,641	6,519	7,640	8,597	8,897	9,117	10,151	10,811	11,826	11,690	12,619	13,307	13,362	13,922	14,703	15,231	15,473
II. System Peak (MW)																		
A. Interconnected System	3,694	3,981	4,672	5,158	5,361	5,803	6,152	6,279	6,664	7,086	7,506	7,896	8,312	8,758	9,189	9,769	10,280	10,798
B. Isolated System	0	4	17	22	25	28	40	41	45	49	72	107	127	150	177	90	104	119
III. Units Generated (GWh)																		
A. Interconnected System																		
(i) Hydro	10,475	10,267	9,637	9,004	9,046	9,105	8,259	9,323	9,972	9,500	9,500	9,500	9,900	9,900	9,900	9,900	9,900	9,900
(ii) Thermal - Steam	7,965	9,410	11,968	14,424	18,042	20,406	24,282	25,095	24,098	30,710	29,667	28,367	27,713	27,179	29,437	32,366	34,861	37,348
(iii) Combustion Turbines (Inc. C.C.)	3,459	4,867	6,136	6,706	5,158	5,692	5,306	5,168	7,578	3,678	7,191	10,689	13,358	16,473	16,606	16,780	16,928	17,076
Total A	21,899	24,544	27,741	30,134	32,246	35,203	37,847	39,586	41,648	43,888	46,358	48,556	50,971	53,552	55,943	59,046	61,689	64,324
B. Isolated System	0	20	88	116	131	147	208	218	236	257	381	564	666	786	929	473	545	626
Total Units Generated (A+B)	21,899	24,564	27,829	30,250	32,377	35,350	38,055	39,804	41,884	44,145	46,739	49,120	51,637	54,338	56,872	59,519	62,234	64,950
IV. Units Sent Out (GWh)																		
A. Interconnected System																		
(i) Hydro	N.A.	N.A.	E.A.	N.A.	N.A.	N.A.	8,110	9,145	9,829	9,364	9,364	9,364	9,758	9,758	9,758	9,758	9,758	9,758
(ii) Thermal - Steam	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	22,847	23,524	22,607	29,078	27,928	26,624	25,914	25,319	27,478	30,162	32,543	34,916
(iii) Combustion Turbines (Inc. C.C.)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	5,265	5,119	7,514	3,647	7,119	10,529	13,158	16,226	16,357	16,528	16,674	16,820
Total A	21,148	23,731	26,713	28,921	30,899	33,799	36,222	37,788	39,950	42,089	44,411	46,517	48,830	51,303	53,593	56,448	58,975	61,494
B. Isolated System	0	20	86	114	128	144	204	214	231	252	375	553	653	770	910	464	534	613
Total Units Sent Out (A+B)	21,148	23,751	26,799	29,035	31,027	33,943	36,426	38,002	40,181	42,341	44,786	47,070	49,483	52,073	54,503	56,912	59,509	62,107
V. Units Sold by EEA (GWh)																		
A. Interconnected System	19,035	21,528	24,544	26,061	28,538	31,069	33,217	34,870	37,198	39,181	41,342	43,493	45,656	47,968	50,377	53,061	55,731	58,112
B. Isolated System	0	20	86	114	128	144	204	214	231	252	375	553	653	770	910	464	534	613
Total Units Sold by EEA (A+B)	19,035	21,548	24,630	26,175	28,666	31,213	33,421	35,084	37,429	39,433	41,715	44,046	46,309	48,738	51,287	53,525	56,265	58,725
of which Sales by EEA to EDA	13,709	15,993	18,284	19,753	21,767	23,853	25,318	26,532	28,259	29,978	31,898	33,994	36,000	38,097	40,313	42,200	44,500	46,500
VI. Units Sold to End Users by System (GWh)																		
A. Interconnected System	0	19,381	22,180	23,675	26,041	28,197	30,349	32,108	34,187	35,985	37,953	39,804	41,814	43,944	46,130	48,933	51,431	54,010
B. Isolated System	0	18	79	105	118	132	188	197	212	232	343	508	600	708	837	427	491	564
Total Units Sold (A+B)	17,201	19,399	22,259	23,780	26,159	28,329	30,537	32,305	34,399	36,217	38,296	40,312	42,414	44,652	46,967	49,360	51,922	54,574

EGYPT
KUREMAT POWER PROJECT
EEA - Generation and Sales

	Actual										Projected							
	FY82	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
VII. Units Sold by Consumer Categories (GWh)																		
A. Industrial																		
(i) at 220 & 132-kV	4,089	4,152	4,774	4,624	4,910	5,371	5,935	6,177	6,629	6,770	6,980	7,054	7,144	7,204	7,440	7,588	7,816	8,051
(ii) at 66-kV	694	812	880	1,016	1,167	1,200	1,326	1,459	1,566	1,661	1,763	1,871	1,986	2,108	2,238	2,375	2,521	2,676
(iii) at Medium and Lower Voltages	4,847	5,358	5,808	6,151	6,735	7,115	7,512	8,055	8,536	9,046	9,602	10,192	10,818	11,682	12,187	12,936	13,731	14,574
Total Industrial	9,630	10,322	11,462	11,791	12,812	13,686	14,773	15,691	16,731	17,477	18,345	19,117	19,948	20,884	21,865	22,899	24,068	25,301
B. Domestic	4,124	5,055	6,237	7,121	8,059	8,864	9,844	10,440	10,931	11,669	12,465	13,274	14,093	14,920	15,752	16,588	17,426	18,263
C. Public Services	1,324	1,603	1,739	1,752	1,964	2,192	2,207	2,165	2,369	2,559	2,706	2,861	3,025	3,198	3,352	3,575	3,780	3,997
D. Commercial	564	701	885	1,043	1,194	1,380	1,441	1,526	1,631	1,669	1,782	1,899	2,016	2,137	2,263	2,393	2,528	2,668
E. Agricultural	836	897	1,007	1,108	1,197	1,166	1,221	1,265	1,344	1,407	1,473	1,541	1,612	1,687	1,765	1,845	1,932	2,021
F. Government	723	821	929	965	933	1,041	1,051	1,218	1,393	1,436	1,525	1,620	1,720	1,826	1,940	2,060	2,188	2,324
Total Units Sold	17,201	19,399	22,259	23,780	26,159	28,329	30,537	32,305	34,399	36,217	38,296	40,312	42,414	44,652	46,967	49,360	51,922	54,574
of which Sales by EEA	11,875	13,844	15,913	17,358	19,260	20,969	22,434	23,753	25,229	26,763	28,479	30,261	32,104	34,013	35,991	38,036	40,156	42,349
VIII. Station Auxiliary Consumption (%)																		
A. Interconnected System																		
(i) Hydro							1.80%	1.91%	1.43%	1.43%	1.43%	1.43%	1.43%	1.43%	1.43%	1.43%	1.43%	1.43%
(ii) Thermal							5.91%	6.26%	6.19%	5.31%	5.86%	6.14%	6.49%	6.84%	6.65%	6.81%	6.65%	6.51%
(iii) Combustion Turbines (Inc. C.G.)							0.77%	0.95%	0.84%	0.84%	1.00%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Total A	3.43%	3.31%	3.71%	4.03%	4.18%	3.99%	4.29%	4.54%	4.08%	4.10%	4.20%	4.20%	4.20%	4.20%	4.20%	4.40%	4.40%	4.40%
B. Isolated System	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Total EEA (A+B)	3.55%	3.42%	3.84%	4.18%	4.35%	4.15%	4.47%	4.74%	4.24%	4.26%	4.37%	4.36%	4.35%	4.35%	4.35%	4.58%	4.58%	4.58%
IX. Line Losses (%)																		
A. EEA's System																		
(i) Interconnected System	9.99%	9.28%	8.12%	9.89%	7.64%	8.08%	8.30%	7.72%	6.89%	6.91%	6.91%	6.50%	6.50%	6.50%	6.00%	6.00%	5.50%	5.50%
EEA's System incl. Iso. System	9.99%	9.28%	8.09%	9.85%	7.61%	8.04%	8.25%	7.68%	6.85%	6.87%	6.85%	6.42%	6.41%	6.40%	5.90%	5.95%	5.45%	5.45%
B. Distribution Companies' System																		
(i) Interconnected System	13.38%	13.44%	12.99%	12.15%	11.54%	12.11%	11.42%	10.49%	10.74%	10.75%	10.75%	11.03%	10.87%	10.78%	10.78%	9.89%	9.78%	8.94%
(ii) Isolated System	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%	8.06%
Total DCA's System	13.38%	13.44%	12.97%	12.12%	11.52%	12.09%	11.39%	10.47%	10.72%	10.72%	10.72%	10.98%	10.82%	10.72%	10.72%	9.87%	9.76%	8.93%
C. Combined-EEA & Distribution Companies	18.66%	18.32%	16.94%	18.10%	15.69%	16.54%	16.17%	14.99%	14.39%	14.46%	14.49%	14.36%	14.29%	14.25%	13.83%	13.27%	12.75%	12.13%
X. Fuel Consumption																		
A. Heavy Fuel Oil (x 1000 mt)	2,398	2,971	3,417	3,518	3,463	3,945	4,200	4,063	4,041	4,842	4,799	4,657	4,657	4,692	4,938	5,375	5,747	6,005
B. Diesel Oil (x 1000 mt)	616	612	765	880	135	142	192	99	11	106	157	232	275	324	383	195	225	258
C. Natural Gas (in million cubic meters)	913	1,302	1,650	2,117	3,409	3,587	4,092	4,364	4,645	4,227	4,763	5,354	5,873	6,498	6,766	7,084	7,347	7,607
D. Petroleum Coke (x 1000 mt)				33	19													
D. Naptha (x 1000 mt)	67	69	63	36	8	0	0	0	1									

EGYPT
KUREIMAT POWER PROJECT
EEA - Installed Generation Capacity

	Actual										Projected							
	FY82	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
I. Installed Capacity-Interconn. System (MW)																		
A. Hydro																		
(i) Aswan High Dam (12x175= 2100)	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
(ii) Aswan I (7x46+2x11.5= 345)	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
(iii) Aswan II (4x67.5= 270)	0	0	0	0	270	270	270	270	270	270	270	270	270	270	270	270	270	270
(iv) Esna (7x14.3)													100	100	100	100	100	100
Subtotal A	2,445	2,445	2,445	2,445	2,715	2,715	2,715	2,715	2,715	2,715	2,715	2,715	2,815	2,815	2,815	2,815	2,815	2,815
B. Thermal																		
(i) Cairo West (4x87.5+2x300 = 950)	350	350	350	350	350	350	350	350	350	350	0	650	950	950	950	950	950	950
(ii) Cairo South (4x60+2x7.5= 255)	255	255	255	255	255	255	255	255	255	255	255	255	195	195	195	195	195	135
(iii) Cairo North (2x30+1x20+2x10= 100)	100	100	100	100	100	100	100	100	100	100	60	60	60	60	60	30	0	0
(iv) El Tebbin (3x15 = 45)	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
(v) Shoubrah (4x315= 1260)	0	0	315	630	945	945	945	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260
(vi) Talkha (3x12.5+3x30+1x200 = 327.5)	127	127	127	127	127	127	127	127	127	127	328	328	328	328	315	303	290	290
(vii) Damhour (2x15+3x65+1x300 = 555)	225	225	225	225	225	225	225	225	225	225	525	525	525	525	525	525	525	525
(viii) Kafr El Damer (4x110= 440)	220	220	220	330	440	440	440	440	440	440	440	440	440	440	440	440	440	440
(ix) El Suif (2x26.5+2x30= 113)	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	60	60	60
(x) Abu Kir (4x150+1x300 = 900)		150	450	600	600	600	600	600	600	900	900	900	900	900	900	900	900	900
(xi) Suez (2x25+1x100= 200)	100	100	100	100	100	100	100	100	100	200	200	200	200	200	200	200	200	200
(xii) Abu Sultan (4x150= 600)		150	300	450	600	600	600	600	600	600	600	600	600	600	600	600	600	600
(xiii) Attaka (2x150+2x300= 900)				300	300	600	600	600	600	900	900	900	900	900	900	900	900	900
(xiv) Assuit (3x30+2x300 = 690)	90	90	90	90	90	90	90	90	90	90	390	390	390	390	690	690	690	690
(xv) Kureimat (2x630 = 1260)															630	1,260	1,260	1,260
(xvi) Sidi Kreir (2x315 = 630)															315	630	630	630
(xvii) Ayoun Moussa (2x315 = 630)																315	630	630
Subtotal B	1,625	1,925	2,690	3,715	4,290	4,590	4,590	4,905	5,205	5,905	5,815	6,666	7,206	7,206	7,791	8,640	9,228	9,470
C. Combustion Turbines & Combined Cycle																		
(i) Cairo South C.C. (3x110+3x55= 495)							220	220	330	330	330	330	440	495	495	495	475	495
(ii) Cairo East (2x23= 46)	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
(iii) Helipolis (3x12.5= 37.5)	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
(iv) El Tebbin (2x23 = 46)	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
(v) Helwan (5x24= 120)	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
(vi) Medinet Nasr (3x33= 99)				0	99	99	99	99	99	99	99	99	99	99	99	99	99	99
(vii) Shoubrah (1x36= 36)					36	36	36	36	36	36	36	36	36	36	36	36	36	36
(viii) Talkha C.C. (8x24+2x50= 292)	192	192	192	192	192	192	192	292	292	292	292	292	292	292	292	292	292	292
(ix) Damhour C.C. (4x24+1x46= 142)				96	96	96	96	96	96	96	96	96	142	142	142	142	142	142
(x) Mahmoudia C.C. (4x50+8x24+2x46= 484)	200	392	392	392	392	392	392	392	392	392	392	392	284	284	284	284	284	284

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KUREIMAT POWER PROJECT

EEA Installed Generation Capacity

	Actual										Projected							
	FY82	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
(xi) Damietta C.C. (6x125+3x125= 1125)								500	750	1,125	1,125	1,125	1,125	1,125	1,125	1,125	1,125	1,125
(xii) Karwouz (2x12.5= 25)	25	25	25	25	25	25	25	25	25	25	25	25	25	25				
(xiii) El Suif (1x20+6x33= 218)	125	218	218	218	218	218	218	218	218	218	218	218	218	218	218	218	218	218
(xiv) El Max (2x14= 28)	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
(xv) Abu Kir (1x20= 20)		20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
(xvi) Ismailia (1x20= 20)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
(xvii) Suez (1x17= 17)	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
(xviii) Shabab (5x33= 99)		66	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
(xix) Port Said (3x20= 60)			60	60	60	60	60	60	60	40	40	40	40	40	40	40	40	40
(xx) Faioum (1x20= 20)			20	20	20	20	20	20	20									
(xxi) Cairo North (1x23= 23)	23	23	23	23														
(xxii) Abu El Matamir (1x20= 20)	20	20	20	20	20	20	20	20	20									
Subtotal C.	900	1,271	1,384	1,480	1,592	1,592	1,812	2,412	2,772	3,087	3,041	3,013	3,061	3,116	3,091	3,054	3,014	3,014
Total Interconnected system (A+B+C)	4,970	5,641	6,519	7,640	8,597	8,897	9,117	10,032	10,692	11,707	11,571	12,394	13,082	13,137	13,697	14,509	15,057	15,299

11. Installed Capacity - Isolated Generation (MW)

Total Isolated Generation	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	119	119	119	119	225	225	225	225	194	174	174
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KUREIMAT POWER PROJECT

Table A: Trend of Electricity Tariffs
(mills./Kwh)

	<u>FY83</u>	<u>FY84</u>	<u>FY85</u>	<u>FY86</u>	<u>FY87</u>	<u>FY88</u>	<u>FY89</u>	<u>FY90</u>	<u>FY91</u>
Very high voltage	4.2	5.4	5.9	8.5	10.0	13.7	16.0	20.9	29.4
% increase		29.5%	9.6%	44.1%	17.6%	37.0%	16.8%	30.6%	40.7%
High voltage	6.5	8.7	9.9	14.6	15.7	20.1	23.1	32.4	52.3
% increase		34.0%	13.8%	47.7%	7.5%	28.0%	14.9%	40.2%	61.4%
Medium voltage	24.5	23.0	29.8	32.3	31.5	39.8	42.9	57.1	76.68
% increase		-6.1%	29.6%	8.4%	-2.5%	26.3%	7.8%	33.1%	34.3%
EEA weighted average	8.3	9.7	11.0	15.4	16.4	22.0	23.9	30.2	43.3
EDA weighted average	15.3	17.7	20.3	26.8	28.6	36.5	39.2	50.2	66.9
Weighted Average (EEA and EDA)	12.4	14.5	16.9	22.6	24.3	30.0	33.7	43.4	59.1
% increase		17.2%	16.4%	34.0%	7.5%	23.5%	12.3%	28.8%	36.2%

Note: Electricity prices are the weighted average tariffs applicable to end users.

Table B: Breakdown of LRMC Costs

	<u>FY91</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>
Crude oil prices (US\$/bbl)	19.50	17.55	17.90	19.05	20.25	21.86	23.86	26.04	28.43
LRMC (US cents/kWh)									
Generation cost (incl. O&M)	1.29	1.34	1.39	1.45	1.50	1.56	1.62	1.69	1.75
Fuel cost	1.64	1.48	1.51	1.60	1.70	1.84	2.01	2.19	2.39
T&D cost including O&M and losses	1.39	1.45	1.61	1.67	1.75	1.80	1.85	1.90	1.95
LRMC cost									
- US cents/kWh	4.32	4.37	4.51	4.72	4.95	5.20	5.48	5.78	6.09
- Mills./kWh	142.44	177.86	202.75	222.91	238.34	252.93	269.33	287.10	305.94
Target price as % of LRMC	59.0%	69.0%	80.0%	90.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Average tariff (Us cents/kWh)	2.55	3.02	3.60	4.25	4.95	5.20	5.48	5.78	6.09
Average tariff in local currency (mills./kWh)	82.53	122.72	162.20	200.62	238.34	252.93	269.33	287.10	305.94
Required increases to achieve target prices		48.7%	32.2%	23.7%	18.8%	6.1%	6.5%	6.6%	6.6%

Note: Breakdown of LRMC costs for FY91 given is based on the negotiations in Paris for SAL. The projected costs are based on the latest forecast of future oil prices and inflation.

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KUREIMAT POWER PROJECT

Electricity Tariffs
(Milliemes/kwh)

	<u>FY88</u>	<u>April 89</u>	<u>Percent Increase</u>	<u>May 90</u>	<u>Percent Increase</u>	<u>May 91</u>	<u>Percent Increase</u>
I. EEA							
1 Very high voltage							
Kims	12.20	12.20	0.0	12.20	0.0	17.00	39.3
Aluminum	10.80	18.00	66.7	28.89	44.5	46.00	59.2
Somed	13.40	22.24	65.9	35.70	60.5	63.18	76.9
Assuit Cement 1	23.33	23.33	0.0	35.70	53.0	63.19	76.9
Assuit Cement 2	23.33	23.33	0.0	35.70	53.0	63.19	76.9
Ferrocilicon	12.20	20.25	65.9	32.58	60.9	57.67	77.0
Iron and steel	26.60	29.79	11.9	41.75	40.2	63.19	51.4
Amiria Spinning	24.50	26.46	8.0	45.58	72.3	63.19	38.6
2 High voltage							
Industry	17.10	28.39	66.0	45.58	60.6	80.68	77.0
Cement	29.65	29.65	0.0	45.58	53.7	80.68	77.0
Miratex	24.50	26.46	8.0	43.88	65.8	80.68	83.9
Agriculture	17.10	28.39	66.0	45.58	60.6	80.68	77.0
Government	17.10	28.39	66.0	45.58	60.6	80.68	77.0
3 Medium voltage							
Suez cement	42.00	47.04	12.0	66.33	41.0	117.41	77.0
Agriculture	32.30	53.62	66.0	86.07	60.6	152.33	76.9
Assuit Pipelines	33.00	54.78	66.0	87.92	60.5	155.62	77.0
II. DC/S							
Medium voltage							
Moving power >500 kw	33.14	55.01	66.0	75.00	36.3	132.75	77.0
Moving power <500 kw	55.00	55.00	0.0	70.00	27.3	70.00	0.0
Others	45.00	50.40	12.0	90.00	78.6	124.65	38.5
Residential							
100 kwh	18.00	19.01	5.6	22.00	15.7	30.00	36.4
101-200 kwh	30.00	32.01	6.7	35.00	9.3	45.00	28.6
201-350 kwh	38.00	41.99	10.5	50.00	19.1	65.00	30.0
351-500 kwh	46.00	50.00	8.7	60.00	20.0	75.00	25.0
501-650 kwh	60.00	66.00	10.0	80.00	21.2	100.00	25.0
651-800 kwh	70.00	80.01	14.3	100.00	25.0	120.00	20.0
801-1000 kwh	80.00	90.00	12.5	120.00	33.3	140.00	16.7
1001-2000 kwh	100.00	112.00	12.0	140.00	25.0	160.00	14.3
2001-4000 kwh	120.00	129.96	8.3	150.00	15.4	175.00	16.7
>4000 kwh	140.00	140.00	0.0	160.00	14.3	185.00	15.6
Commercial							
100 kwh	21.00	28.01	33.4	34.00	21.4	45.00	32.4
101-200 kwh	36.00	47.02	30.6	54.00	14.8	65.00	20.4
201-350 kwh	64.00	80.00	25.0	88.00	10.0	98.00	11.4
351-500 kwh	88.00	99.97	13.6	110.00	10.0	130.00	18.2
501-1000 kwh	100.00	120.00	20.0	130.00	8.3	150.00	15.4
1001-2000 kwh	120.00	140.04	16.7	155.00	10.7	185.00	19.4
2001-4000 kwh	140.00	150.08	7.2	165.00	9.9	210.00	27.3
>4000 kwh	160.00	170.08	6.3	180.00	5.8	230.00	27.8
Government	64.00	100.03	56.3	135.00	35.0	185.50	37.4
Public lighting	64.00	100.03	56.3	135.00	35.0	185.50	37.4
Housing companies	22.60	29.83	32.0	38.00	27.4	60.00	57.9

Source: EEA

1/ The electricity prices represent charges to consumers for energy consumption but do not include consumers' demand charges. However, the average tariffs shown in Table A (page 1 of this Annex) include both energy and demand charges.

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KUREIMAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

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	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92	FY99	TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
1. Generation																			
A. Ongoing Projects																			
(i) Damietta Combined Cycle																			
1. Supply and Installation	9,907	119,001	2,097	25,764	543	22,974	0	0	0	0	0	0	0	0	0	0	12,547	167,739	180,286
2. Duties and Taxes	1,142		309		138		0		0		0		0		0		1,589	0	1,589
3. Subtotal	11,049	119,001	2,406	25,764	681	22,974	0	0	0	0	0	0	0	0	0	0	14,136	167,739	181,875
4. Physical Contingencies	1,105	11,900	241	2,576	68	2,297	0	0	0	0	0	0	0	0	0	0	1,414	16,773	18,187
5. Subtotal	12,154	130,901	2,647	28,340	749	25,271	0	0	0	0	0	0	0	0	0	0	15,550	184,512	200,062
6. Price Contingencies	1,702	18,326	995	10,656	403	13,596	0	0	0	0	0	0	0	0	0	0	3,100	42,578	45,678
7. Total (i)	13,856	149,227	3,642	38,996	1,152	38,867	0	0	0	0	0	0	0	0	0	0	18,650	227,090	245,740
(ii) Cairo South Combined Cycle																			
1. Supply and Installation	5,045	110,332	3,500	29,770	2,550	59,109	2,100	44,129	0	0	0	0	0	0	0	0	13,195	243,340	256,535
2. Duties and Taxes	1,139		1,250		2,483		1,873		0		0		0		0		6,725	0	6,725
3. Subtotal	6,184	110,332	4,750	29,770	5,033	59,109	3,953	44,129	0	0	0	0	0	0	0	0	19,920	243,340	263,260
4. Physical Contingencies	618	11,033	475	2,977	503	5,911	395	4,413	0	0	0	0	0	0	0	0	1,991	24,334	26,325
5. Subtotal	6,802	121,365	5,225	32,747	5,536	65,020	4,348	48,542	0	0	0	0	0	0	0	0	21,911	267,674	289,585
6. Price Contingencies	952	16,991	1,965	12,313	2,978	34,981	2,839	31,698	0	0	0	0	0	0	0	0	8,734	95,983	104,717
7. Total (ii)	7,754	138,356	7,190	45,060	8,514	100,001	7,187	80,240	0	0	0	0	0	0	0	0	30,645	363,657	394,302
(iii) Damhour Combined Cycle																			
1. Supply and Installation	600	10,290	3,300	27,306	3,500	59,108	500	57,209	0	27,306	0	0	0	0	0	0	8,100	181,219	189,319
2. Duties and Taxes	432		1,147		2,483		2,403		1,147		0		0		0		7,612	0	7,612
3. Subtotal	1,032	10,290	4,447	27,306	5,983	59,108	2,903	57,209	1,147	27,306	0	0	0	0	0	0	15,712	181,219	196,931
4. Physical Contingencies	103	1,029	445	2,731	598	5,911	290	5,721	115	2,731	0	0	0	0	0	0	1,571	18,123	19,694
5. Subtotal	1,135	11,319	5,112	30,037	6,581	65,019	3,193	62,930	1,262	30,037	0	0	0	0	0	0	17,283	199,342	216,625
6. Price Contingencies	159	1,585	1,922	11,294	3,541	34,980	2,085	41,093	938	22,317	0	0	0	0	0	0	8,645	111,269	119,914
7. Total (iii)	1,294	12,904	7,034	41,331	10,122	99,999	5,278	104,023	2,200	52,354	0	0	0	0	0	0	25,928	310,611	336,539

EGYPT

KUREIHAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

	IN THOUSAND LE																			
	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL	
(iv) Mahrezia Combined Cycle																				
1. Supply and Installation	458	13,503	7,450	49,634	2,760	119,747	0	119,747	0	49,633	0	0	0	0	0	0	10,460	352,264	362,924	
2. Duties and Taxes	567		2,085		5,029		5,029		2,085		0		0		0		14,795	0	14,795	
3. Subtotal	1,017	13,503	9,535	49,634	7,789	119,747	5,029	119,747	2,085	49,633	0	0	0	0	0	0	25,455	352,264	377,719	
4. Physical Contingencies	102	1,350	954	4,963	779	11,975	503	11,975	209	4,963	0	0	0	0	0	0	2,547	35,226	37,773	
5. Subtotal	1,119	14,853	10,489	54,597	8,568	131,722	5,532	131,722	2,294	54,596	0	0	0	0	0	0	28,002	387,490	415,492	
6. Price Contingencies	157	2,079	3,944	20,528	4,610	70,866	3,612	86,014	1,704	40,565	0	0	0	0	0	0	14,027	220,052	234,079	
7. Total (iv)	1,276	16,932	14,433	75,125	13,178	202,588	9,144	217,736	3,998	95,161	0	0	0	0	0	0	42,029	607,542	649,571	
(v) Talkha Thermal Power Extension																				
1. Supply and Installation	14,100	72,494	800	17,832	1,200	27,942	0	0	0	0	0	0	0	0	0	0	16,100	118,268	134,368	
2. Duties and Taxes	3,045		749		1,174		0		0		0		0		0		4,968	0	4,968	
3. Subtotal	17,145	72,494	1,549	17,832	2,374	27,942	0	0	0	0	0	0	0	0	0	0	21,068	118,268	139,336	
4. Physical Contingencies	1,715	7,249	155	1,783	237	2,794	0	0	0	0	0	0	0	0	0	0	2,107	11,826	13,933	
5. Subtotal	18,860	79,743	1,704	19,615	2,611	30,736	0	0	0	0	0	0	0	0	0	0	23,175	130,094	153,269	
6. Price Contingencies	2,640	11,164	641	7,375	1,405	16,536	0	0	0	0	0	0	0	0	0	0	4,686	35,075	39,761	
7. Total (v)	21,500	90,907	2,345	26,990	4,016	47,272	0	0	0	0	0	0	0	0	0	0	27,861	165,169	193,030	
(vi) Assuit Thermal Power Extension																				
1. Supply and Installation	9,950	89,793	15,100	99,101	6,650	207,391	8,406	295,745	0	69,430	0	0	0	0	0	0	40,106	761,460	801,566	
2. Duties and Taxes	3,771		4,162		8,710		12,421		2,916		0		0		0		31,980	0	31,980	
3. Subtotal	13,721	89,793	19,262	99,101	15,360	207,391	20,827	295,745	2,916	69,430	0	0	0	0	0	0	72,086	761,460	833,546	
4. Physical Contingencies	1,372	8,979	1,926	9,910	1,536	20,739	2,083	29,573	292	6,943	0	0	0	0	0	0	7,209	76,146	83,355	
5. Subtotal	15,093	98,772	21,188	109,011	16,896	228,130	22,910	325,320	3,208	76,373	0	0	0	0	0	0	79,295	837,606	916,901	
6. Price Contingencies	2,113	13,828	7,967	40,988	9,090	122,734	14,960	212,434	2,384	56,745	0	0	0	0	0	0	36,514	446,729	483,243	
7. Total (vi)	17,206	112,600	29,155	149,999	25,986	350,864	37,870	537,754	5,592	133,118	0	0	0	0	0	0	115,809	1,284,335	1,400,144	
(vii) Cairo West Thermal Power																				
1. Supply and Installation	12,485	162,288	25,950	247,785	24,685	418,514	11,220	165,268	0	0	0	0	0	0	0	0	74,340	993,855	1,068,195	
2. Duties and Taxes	6,816		10,407		17,578		6,941		0		0		0		0		41,742	0	41,742	
3. Subtotal	19,301	162,288	36,357	247,785	42,263	418,514	18,161	165,268	0	0	0	0	0	0	0	0	116,082	993,855	1,109,937	
4. Physical Contingencies	1,930	16,229	3,636	24,779	4,226	41,851	1,816	16,527	0	0	0	0	0	0	0	0	11,608	99,386	110,994	
5. Subtotal	21,231	178,517	39,993	272,564	46,489	460,365	19,977	181,795	0	0	0	0	0	0	0	0	127,690	1,093,241	1,220,931	
6. Price Contingencies	2,972	24,992	15,037	102,484	25,011	247,676	13,045	118,712	0	0	0	0	0	0	0	0	56,065	495,804	549,929	
7. Total (vii)	24,203	203,509	55,030	375,048	71,500	708,041	33,022	300,507	0	0	0	0	0	0	0	0	183,755	1,587,105	1,770,860	

EGYPT

KUREIMAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL	TOTAL
B. New Projects																				
(i) Kureimat Thermal Power Station																				
1. Supply and Installation	5,946	18,810	26,185	143,868	61,801	308,745	111,201	528,557	120,184	617,452	69,439	368,997	28,327	152,934	7,340	51,088	430,423	2,190,451	2,620,874	
2. Duties and Taxes	958		7,178		15,144		24,906		28,663		16,793		6,258		2,202		102,102	0	102,102	
3. Subtotal	6,904	18,810	33,363	143,868	76,945	308,745	136,107	528,557	148,847	617,452	86,232	368,997	34,585	152,934	9,542	51,088	532,525	2,190,451	2,722,976	
4. Physical Contingencies	483	1,429	3,470	13,841	8,322	30,317	14,915	52,063	16,083	61,011	9,129	36,432	3,720	15,470	954	5,109	57,076	215,872	272,948	
5. Subtotal	7,387	20,439	36,833	157,709	85,267	339,062	151,022	580,620	164,930	678,463	95,361	405,429	38,305	168,404	10,496	56,197	589,601	2,406,323	2,995,924	
6. Price Contingencies	1,034	2,861	13,849	59,299	45,874	182,415	98,617	379,145	122,543	504,098	79,150	336,506	35,317	153,268	10,685	57,209	407,069	1,676,801	2,083,870	
7. Total (i)	8,421	23,300	50,682	217,008	131,141	521,477	249,639	959,765	287,473	1,182,561	174,511	741,935	73,622	323,672	21,181	113,406	996,670	4,083,124	5,079,794	
(ii) Sidi Krir Thermal Power Station																				
1. Supply and Installation	0	0	4,923	13,949	14,770	97,666	34,663	195,292	44,003	334,786	64,003	390,583	41,848	237,140	17,232	97,646	241,242	1,367,042	1,608,284	
2. Duties and Taxes	0	0	586		4,101		8,202		14,061		16,404		9,960		4,101		57,415	0	57,415	
3. Subtotal	0	0	5,509	13,949	18,871	97,666	42,665	195,292	78,064	334,786	80,407	390,583	51,808	237,140	21,333	97,646	298,657	1,367,042	1,665,699	
4. Physical Contingencies	0	0	551	1,395	1,887	9,785	4,267	19,529	7,806	33,479	8,041	39,058	5,181	25,714	2,133	9,765	29,866	136,705	166,571	
5. Subtotal	0	0	6,060	15,344	20,758	107,451	46,932	214,821	85,870	368,265	88,448	429,641	56,989	262,854	23,466	107,411	328,523	1,503,747	1,832,270	
6. Price Contingencies	0	0	2,279	5,769	11,168	57,787	30,647	140,278	63,801	273,621	75,412	356,602	52,544	240,507	23,888	109,344	257,739	1,183,908	1,441,647	
7. Total (ii)	0	0	8,339	21,113	31,926	165,198	77,579	355,099	149,671	641,886	161,860	786,243	109,533	501,361	47,354	216,755	586,262	2,687,655	3,273,917	
(iii) Ayoun Mousa Thermal Power Stn.																				
1. Supply and Installation	0	0	0	0	0	0	5,095	14,436	16,813	111,154	71,329	404,195	72,857	405,350	66,234	343,566	232,328	1,278,701	1,511,029	
2. Duties and Taxes	0	0	0	0	0	0	606		4,668		16,976		17,025		14,430		53,705	0	53,705	
3. Subtotal	0	0	0	0	0	0	5,701	14,436	21,481	111,154	88,305	404,195	89,882	405,350	80,664	343,566	286,033	1,278,701	1,564,734	
4. Physical Contingencies	0	0	0	0	0	0	570	1,444	2,148	11,115	8,351	40,420	8,988	40,535	8,066	34,357	28,403	127,871	156,474	
5. Subtotal	0	0	0	0	0	0	6,271	15,880	23,629	122,269	97,136	444,615	98,870	445,885	88,730	377,923	314,436	1,406,572	1,721,208	
6. Price Contingencies	0	0	0	0	0	0	4,095	10,370	17,556	90,846	80,623	369,030	91,158	411,106	90,327	384,726	283,759	1,266,078	1,549,837	
7. Total (iii)	0	0	0	0	0	0	10,366	26,250	41,185	213,115	177,759	813,645	190,028	856,991	179,057	762,649	598,395	2,672,650	3,271,045	
(iv) Abu Qir, Damhour (Th) & Misc.																				
1. Supply and Installation	20,930	53,157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20,930	53,157	74,087	
2. Duties and Taxes	2,233		0		0		0		0		0		0		0		2,233	0	2,233	
3. Subtotal	23,163	53,157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23,163	53,157	76,320	
4. Physical Contingencies	2,316	5,316	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,316	5,316	7,632	
5. Subtotal	25,479	58,473	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,479	58,473	83,952	
6. Price Contingencies	3,567	8,186	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,567	8,186	11,753	
7. Total (iv)	29,046	66,659	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29,046	66,659	95,705	

EGYPT

KUREIMAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92	FY99
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	TOTAL
(v) Zafarana Thermal Power Station																		
1. Supply and Installation	0	0	0	0	0	0	0	0	15,105	99,860	50,330	285,314	100,988	567,368	93,507	570,629	259,950	1,523,171
2. Duties and Taxes	0	0	0	0	0	0	0	0	4,194		11,983		23,829		23,966		63,972	0
3. Subtotal	0	0	0	0	0	0	0	0	19,299	99,860	62,333	285,314	124,817	567,368	117,473	570,629	323,922	1,523,171
4. Physical Contingencies	0	0	0	0	0	0	0	0	1,930	9,966	6,233	28,531	12,482	56,737	11,747	57,063	32,392	152,317
5. Subtotal	0	0	0	0	0	0	0	0	21,229	109,846	68,566	313,845	137,299	624,105	129,220	627,692	356,314	1,675,488
6. Price Contingencies	0	0	0	0	0	0	0	0	15,773	81,616	56,970	260,491	126,590	575,425	131,546	638,990	330,819	1,556,322
7. Total (v)	0	0	0	0	0	0	0	0	37,002	191,462	125,476	574,336	263,889	1,199,530	260,766	1,266,682	687,133	3,232,010
8. Total I (Generation)	124,556	614,394	177,850	990,670	297,535	2,234,307	430,085	2,581,374	527,121	2,509,657	639,606	2,916,159	637,072	2,881,534	908,358	2,359,492	3,342,183	17,287,607
II. Transmission Lines and Substations																		
A. 500-kV Substations																		
(i) To be Commissioned in FY94																		
1. Supply and Installation																		
(a) El Tebbin Substation			3,593	12,614	7,185	50,456	5,389	50,456	1,796	12,614							17,963	126,140
(b) Abu Zaabal Substation			3,593	12,614	7,185	50,456	5,389	50,456	1,796	12,614							17,963	126,140
(c) Samiut Substation Ext.			20	736	40	2,965	30	2,965	10	736							100	7,362
2. Subtotal	0	0	7,206	25,964	14,410	103,857	10,808	103,857	3,602	25,964	0	0	0	0	0	0	36,026	259,642
3. Duties and Taxes	0	0	1,090		4,362		4,362		1,090		0	0	0	0	0	0	10,904	0
4. Subtotal	0	0	8,296	25,964	18,772	103,857	15,170	103,857	4,692	25,964	0	0	0	0	0	0	46,930	259,642
5. Physical Contingencies	0	0	830	2,596	1,877	10,386	1,517	10,386	469	2,596	0	0	0	0	0	0	4,693	25,964
6. Subtotal	0	0	9,126	28,560	20,649	114,243	16,687	114,243	5,161	28,560	0	0	0	0	0	0	51,623	285,606
7. Price Contingencies	0	0	3,431	10,739	11,109	61,463	10,897	74,601	3,835	21,220	0	0	0	0	0	0	29,272	168,023
8. Total (i)	0	0	12,557	39,299	31,758	175,706	27,584	188,844	8,996	49,780	0	0	0	0	0	0	80,895	453,629
(ii) To be Commissioned in FY95																		
1. Supply and Installation																		
(a) Kureimat Substation (included in the power station)					0	0	3,593	12,614	7,185	50,456	5,389	50,456	1,796	12,614			0	0
(b) New Suez Substation																		0
2. Subtotal	0	0	0	0	0	0	3,593	12,614	7,185	50,456	5,389	50,456	1,796	12,614	0	0	17,963	126,140
3. Duties and Taxes	0	0	0	0	0	0	530		2,119		2,119		530		0	0	5,298	0
4. Subtotal	0	0	0	0	0	0	4,123	12,614	9,304	50,456	7,508	50,456	2,326	12,614	0	0	23,261	126,140
5. Physical Contingencies	0	0	0	0	0	0	412	1,261	930	5,046	751	5,046	233	1,261	0	0	2,326	12,614
6. Subtotal	0	0	0	0	0	0	4,535	13,875	10,234	55,502	8,259	55,502	2,559	13,875	0	0	25,587	138,754
7. Price Contingencies	0	0	0	0	0	0	2,961	9,060	7,604	41,238	6,855	46,067	2,359	12,793	0	0	19,779	109,158
8. Total (ii)	0	0	0	0	0	0	7,496	22,935	17,838	96,740	15,114	101,569	4,916	26,668	0	0	45,366	267,912

EGYPT

KUREIMAT POWER PROJECT

EEA - INVESTMENT PLAN FY92-99

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99		
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL	TOTAL	
(iii) To be Commissioned in FY97																					
1. Supply and Installation																					
(a) Ayoun Mousse Substation									3,595	12,614	7,185	50,456	5,389	50,456	1,796	12,614	17,963	126,140	164,103		
2. Subtotal	0	0	0	0	0	0	0	0	3,595	12,614	7,185	50,456	5,389	50,456	1,796	12,614	17,963	126,140	164,103		
3. Duties and Taxes	0	0	0	0	0	0	0	0	530	2,119	2,119	0	2,119	530	0	0	5,298	0	5,298		
4. Subtotal	0	0	0	0	0	0	0	0	4,125	12,614	9,304	50,456	7,508	50,456	2,326	12,614	23,261	131,440	169,401		
5. Physical Contingencies	0	0	0	0	0	0	0	0	412	1,261	930	5,046	751	5,046	233	1,261	2,326	12,614	16,940		
6. Subtotal	0	0	0	0	0	0	0	0	4,537	13,875	10,234	55,502	8,259	55,502	2,559	13,875	25,587	144,054	186,341		
7. Price Contingencies	0	0	0	0	0	0	0	0	3,370	10,309	8,494	46,067	7,615	51,173	2,605	14,125	22,064	121,674	143,758		
8. Total (iii)	0	0	0	0	0	0	0	0	7,905	24,186	18,728	101,569	15,874	106,675	5,164	28,000	47,671	260,428	308,099		
9. Total A	0	0	12,557	39,299	31,758	175,706	35,080	211,779	34,739	170,704	33,842	283,138	20,792	133,343	5,164	28,000	173,732	961,969	1,133,901		
B. 500-kV Transmission Lines																					
(i) To be Commissioned in FY95																					
1. Supply and Installation																					
(a) Abu Zaabal-El Tebbin	3,200	2,990	6,400	11,960	4,800	11,960	1,600	2,990										16,000	29,900	45,900	
(b) Cairo 500 - Bassoua (Mod)	144	179	192	359	144	359												480	397	1,377	
2. Subtotal	3,344	3,169	6,592	12,319	4,944	12,319	1,600	2,990	0	0	0	0	0	0	0	0	0	16,480	30,797	47,277	
3. Duties and Taxes	133	3,169	517	12,319	517	12,319	126	2,990	0	0	0	0	0	0	0	0	0	1,293	0	1,293	
4. Subtotal	3,477	3,169	7,109	12,319	5,461	12,319	1,726	2,990	0	0	0	0	0	0	0	0	0	17,773	30,797	48,570	
5. Physical Contingencies	348	317	711	1,232	546	1,232	173	299	0	0	0	0	0	0	0	0	0	1,778	3,080	4,858	
6. Subtotal	3,825	3,486	7,820	13,551	6,007	13,551	1,899	3,289	0	0	0	0	0	0	0	0	0	19,551	33,877	53,428	
7. Price Contingencies	536	488	2,940	5,095	3,222	7,290	1,240	2,148	0	0	0	0	0	0	0	0	0	7,948	15,021	22,969	
8. Total (i)	4,361	3,974	10,760	18,646	9,229	20,841	3,139	5,437	0	0	0	0	0	0	0	0	0	27,499	48,898	76,397	
(ii) To be Commissioned in FY95																					
1. Supply and Installation																					
(a) El Tebbin - Kureimat					1,920	1,794	3,840	7,176	2,880	7,176	960	1,794					9,600	17,940	27,540		
(b) Cairo 500-Kureimat (Mod)			3,254	6,732	6,504	13,464	9,758	20,196	9,758	20,196	3,254	6,732					32,528	67,320	99,848		
(c) New Suez-Abu Zaabal					0	0	4,544	6,246	9,088	16,903	6,816	16,983	2,272	4,246			22,720	42,458	65,178		
2. Subtotal	0	0	3,254	6,732	8,424	15,258	18,142	31,618	21,726	44,355	11,030	25,509	2,272	4,246	0	0	64,848	127,718	192,566		
3. Duties and Taxes	0	0	283	6,732	641	15,258	1,328	31,618	1,863	44,355	1,071	25,509	178	4,246	0	0	5,364	0	5,364		
4. Subtotal	0	0	3,537	6,732	9,065	15,258	19,470	31,618	23,589	44,355	12,101	25,509	2,450	4,246	0	0	70,212	127,718	197,930		
5. Physical Contingencies	0	0	354	673	907	1,526	1,947	3,162	2,359	4,436	1,210	2,551	245	425	0	0	7,022	12,773	19,795		
6. Subtotal	0	0	3,891	7,405	9,972	16,784	21,417	34,780	25,948	48,791	13,311	28,060	2,695	4,671	0	0	77,234	140,491	217,725		
7. Price Contingencies	0	0	1,463	2,784	5,365	9,030	13,905	22,711	19,279	36,252	11,048	23,290	2,485	4,307	0	0	53,625	98,374	151,999		
8. Total (ii)	0	0	5,354	10,189	15,337	25,814	35,402	57,491	45,227	85,063	24,359	51,350	5,180	8,978	0	0	130,859	238,865	369,724		

EGYPT

KUREMAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99		
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL	TOTAL	
(iii) To be Commissioned in FY97																					
1. Supply and Installation																					
(a) New Suez-Ayoum Nassa Q/H									1,310	1,226	2,620	4,904	1,965	4,904	655	1,226	6,550	12,260		18,810	
(b) New Suez-Ayoum Nassa U/G									571	9,089	762	18,178	571	18,178			1,904	45,445		47,349	
2. Subtotal	0	0	0	0	0	0	0	0	1,881	10,315	3,382	23,082	2,536	23,082	655	1,226					
3. Duties and Taxes	0	0	0	0	0	0	0	0	433	969	969		969		51		2,422	0		2,422	
4. Subtotal	0	0	0	0	0	0	0	0	2,314	10,315	4,351	23,082	3,505	23,082	706	1,226	10,876	57,705		68,581	
5. Physical Contingencies	0	0	0	0	0	0	0	0	231	1,032	435	2,308	351	2,308	71	123	1,088	5,771		6,859	
6. Subtotal	0	0	0	0	0	0	0	0	2,545	11,347	4,786	25,390	3,856	25,390	777	1,349	11,964	63,476		75,440	
7. Price Contingencies	0	0	0	0	0	0	0	0	1,891	8,431	3,972	21,074	3,555	23,610	791	1,573	10,209	54,288		64,497	
8. Total (iii)	0	0	0	0	0	0	0	0	4,436	19,778	8,758	46,464	7,411	48,800	1,568	2,722	22,173	117,764		139,937	
(iv) To be Commissioned in FY98																					
1. Supply and Installation																					
(a) New Suez-Zaafarana											1,920	1,794	3,840	7,176	2,880	7,176	8,640	16,146		24,786	
(b) Zaafarana-El Tabbin											4,544	4,246	9,088	16,983	6,816	16,983	20,648	38,212		58,660	
2. Subtotal	0	0	0	0	0	0	0	0	0	0	6,464	6,040	12,928	24,159	9,696	24,159					
3. Duties and Taxes	0	0	0	0	0	0	0	0	0	0	254	6,040	12,928	24,159	1,015		2,284	0		2,284	
4. Subtotal	0	0	0	0	0	0	0	0	0	0	6,718	6,040	13,953	24,159	10,711	24,159	31,372	54,358		85,330	
5. Physical Contingencies	0	0	0	0	0	0	0	0	0	0	672	694	1,394	2,416	1,071	2,416	3,137	5,436		8,573	
6. Subtotal	0	0	0	0	0	0	0	0	0	0	7,390	6,644	15,337	26,575	11,782	26,575	34,509	59,794		94,303	
7. Price Contingencies	0	0	0	0	0	0	0	0	0	0	6,134	5,515	14,141	24,502	11,994	27,053	32,269	57,070		89,339	
8. Total (iv)	0	0	0	0	0	0	0	0	0	0	13,524	12,159	29,478	51,077	23,776	53,628	66,778	116,864		183,642	
9. Total B	4,361	3,974	16,114	28,335	24,576	46,495	38,541	62,928	49,663	104,821	46,641	109,973	42,069	108,855	25,344	56,350	247,309	522,391		769,700	

EGYPT

KUREIHAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		TOTAL		
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN			
C. Z20-W Substations																			
(i) To be Commissioned in FY92																			
1. Supply and Installation																			
(a) Asean Z20 Interconnection					834	13,819											2,780	34,548	37,328
(b) West Setra	1,601	6,910	1,112	13,819	2,135	23,305	2,135	23,305									5,871	58,263	64,134
2. Subtotal	2,435	18,563	3,247	37,124	2,969	37,124	0	0	0	0	0	0	0	0	0	0	8,651	92,811	101,462
3. Duties and Taxes	780		1,559		1,559		0	0	0	0	0	0	0	0	0	0	3,898	0	3,898
4. Subtotal	3,215	18,563	4,806	37,124	4,528	37,124	0	0	0	0	0	0	0	0	0	0	12,549	92,811	105,360
5. Physical Contingencies	322	1,856	481	3,712	433	3,712	0	0	0	0	0	0	0	0	0	0	1,256	9,280	10,536
6. Subtotal	3,537	20,419	5,287	40,836	4,961	40,836	0	0	0	0	0	0	0	0	0	0	13,805	102,091	115,896
7. Price Contingencies	495	2,859	1,988	15,334	2,680	21,970	0	0	0	0	0	0	0	0	0	0	5,163	40,183	45,346
8. Total (i)	4,032	23,278	7,275	56,190	7,641	62,806	0	0	0	0	0	0	0	0	0	0	18,968	142,274	161,242
(ii) To be Commissioned in FY94																			
1. Supply and Installation																			
(a) %20 Busbar			1,437	10,839	2,875	43,355	2,156	43,355	719	10,839							7,187	108,388	115,575
(b) Access (11Fy)			1,437	10,839	2,875	43,355	2,156	43,355	719	10,839							7,187	108,388	115,575
(c) Corridor			2,738	7,314	5,476	29,257	4,107	29,257	1,369	7,314							13,690	73,142	86,832
(d) El Khusan			2,738	7,314	5,476	29,257	4,107	29,257	1,369	7,314							13,690	73,142	86,832
(e) El Sharkia (Extension)			2,738	7,314	5,476	29,257	4,107	29,257	1,369	7,314							13,690	73,142	86,832
2. Subtotal	0	0	11,088	43,620	22,178	174,481	16,633	174,481	5,545	43,620	0	0	0	0	0	0	55,444	436,202	491,646
3. Duties and Taxes	0	0	1,832		7,328		7,328		1,832		0	0	0	0	0	0	18,320	0	18,320
4. Subtotal	0	0	12,920	43,620	29,506	174,481	23,961	174,481	7,377	43,620	0	0	0	0	0	0	73,764	436,202	509,966
5. Physical Contingencies	0	0	1,292	4,362	2,951	17,448	2,396	17,448	738	4,362	0	0	0	0	0	0	7,377	43,620	50,997
6. Subtotal	0	0	14,212	47,982	32,457	191,929	26,357	191,929	8,115	47,982	0	0	0	0	0	0	81,141	479,822	560,963
7. Price Contingencies	0	0	5,344	18,041	17,462	103,258	17,211	125,330	6,029	35,651	0	0	0	0	0	0	46,046	282,280	328,326
8. Total (ii)	0	0	19,556	66,023	49,919	295,187	43,568	317,259	14,144	83,633	0	0	0	0	0	0	127,187	762,102	889,289
(iii) To be Commissioned in FY95																			
1. Supply and Installation																			
(a) El Arish			441	206	882	823	662	823	221	206							2,206	2,058	4,264
2. Subtotal	0	0	441	206	882	823	662	823	221	206	0	0	0	0	0	0	2,206	2,058	4,264
3. Duties and Taxes	0	0	9		35		35		9		0	0	0	0	0	0	88	0	88
4. Subtotal	0	0	450	206	917	823	697	823	230	206	0	0	0	0	0	0	2,294	2,058	4,352
5. Physical Contingencies	0	0	45	21	92	82	70	82	23	21	0	0	0	0	0	0	230	206	436
6. Subtotal	0	0	495	227	1,009	905	767	905	253	227	0	0	0	0	0	0	2,524	2,264	4,788
7. Price Contingencies	0	0	186	85	543	487	501	591	188	169	0	0	0	0	0	0	1,418	1,332	2,750
8. Total (iii)	0	0	681	312	1,552	1,392	1,268	1,496	441	396	0	0	0	0	0	0	3,942	3,596	7,538

EGYPT
DUBAIBAT POWER PROJECT
SEA INVESTMENT PLAN FY92-99

IN THOUSAND LE	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		TOTAL		
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
1. Supply and Installation	0	0	0	0	0	0	26,552	65,789	57,390	269,060	48,156	282,690	15,820	76,170	0	0	145,098	689,509	835,607
(a) El Substa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Subtotal	0	0	0	0	0	0	26,552	65,789	57,390	269,060	48,156	282,690	15,820	76,170	0	0	145,098	689,509	835,607
3. Outlets and Tunnels	0	0	0	0	0	0	1,475	5,094	5,094	5,094	5,094	1,475	5,094	0	0	0	14,734	0	14,734
(b) El Substa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(c) Feeds Tunnels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(d) S&T Staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(e) Maint Staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Subtotal	0	0	0	0	0	0	1,475	5,094	5,094	5,094	5,094	1,475	5,094	0	0	0	14,734	0	14,734
5. Physical Contingencies	0	0	0	0	0	0	15,692	35,082	29,933	140,333	140,333	140,333	7,485	35,082	0	0	74,851	350,830	425,661
6. Subtotal	0	0	0	0	0	0	16,861	35,590	32,928	154,366	154,366	154,366	8,221	39,590	0	0	62,313	385,912	460,225
7. Price Contingencies	0	0	0	0	0	0	9,691	25,199	24,664	114,686	27,841	128,126	7,589	35,580	0	0	63,585	305,977	347,182
8. Total (iv)	0	0	0	0	0	0	42,900	106,071	95,016	438,466	123,345	560,811	23,305	117,854	0	0	212,416	1,095,406	1,317,889
9. Total (v)	0	0	0	0	0	0	42,900	106,071	95,016	438,466	123,345	560,811	23,305	117,854	0	0	212,416	1,095,406	1,317,889
1. Supply and Installation	2,738	7,314	5,476	29,257	4,107	29,257	2,738	7,314	5,476	29,257	4,107	29,257	2,738	7,314	5,476	29,257	13,690	73,142	86,832
(a) El Substa	2,738	7,314	5,476	29,257	4,107	29,257	2,738	7,314	5,476	29,257	4,107	29,257	2,738	7,314	5,476	29,257	13,690	73,142	86,832
(b) S&T Staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(c) Feeds Tunnels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(d) S&T Staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(e) Maint Staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Subtotal	2,738	7,314	5,476	29,257	4,107	29,257	2,738	7,314	5,476	29,257	4,107	29,257	2,738	7,314	5,476	29,257	13,690	73,142	86,832
3. Outlets and Tunnels	0	0	0	0	0	0	1,475	5,094	5,094	5,094	5,094	1,475	5,094	0	0	0	14,734	0	14,734
(b) El Substa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(c) Feeds Tunnels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(d) S&T Staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(e) Maint Staff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Subtotal	0	0	0	0	0	0	1,475	5,094	5,094	5,094	5,094	1,475	5,094	0	0	0	14,734	0	14,734
5. Physical Contingencies	0	0	0	0	0	0	15,692	35,082	29,933	140,333	140,333	140,333	7,485	35,082	0	0	74,851	350,830	425,661
6. Subtotal	0	0	0	0	0	0	16,861	35,590	32,928	154,366	154,366	154,366	8,221	39,590	0	0	62,313	385,912	460,225
7. Price Contingencies	0	0	0	0	0	0	9,691	25,199	24,664	114,686	27,841	128,126	7,589	35,580	0	0	63,585	305,977	347,182
8. Total (iv)	0	0	0	0	0	0	42,900	106,071	95,016	438,466	123,345	560,811	23,305	117,854	0	0	212,416	1,095,406	1,317,889
9. Total (v)	0	0	0	0	0	0	42,900	106,071	95,016	438,466	123,345	560,811	23,305	117,854	0	0	212,416	1,095,406	1,317,889

EGYPT

MINIHEAT POWER PROJECT

SEA INVESTMENT PLAN FY92-99

D. 229-10 Transmission Lines	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1. Supply and Installation	423	453	566	906	423	906	423	906	423	906	423	906	423	906	423	906	423	906	3,675
(a) Salween - El Tobbien	6,050	5,600	7,706	7,706	6,050	7,706	6,050	7,706	6,050	7,706	6,050	7,706	6,050	7,706	6,050	7,706	6,050	7,706	32,760
(b) Salween - El Tobbien	1,421	1,096	1,933	1,776	1,421	1,933	1,421	1,933	1,421	1,933	1,421	1,933	1,421	1,933	1,421	1,933	1,421	1,933	9,568
(c) Damietta - Kamah	1,776	1,208	2,368	2,416	1,776	2,416	1,776	2,416	1,776	2,416	1,776	2,416	1,776	2,416	1,776	2,416	1,776	2,416	11,960
(d) Tanta - Bahalla	6,479	10,226	12,939	7,670	12,939	7,670	12,939	7,670	12,939	7,670	12,939	7,670	12,939	7,670	12,939	7,670	12,939	57,963	
2. Subtotal	7,770	6,479	10,226	12,939	7,670	12,939	7,670	12,939	7,670	12,939	7,670	12,939	7,670	12,939	7,670	12,939	7,670	12,939	57,963
3. Duties and Taxes	272	544	272	544	272	544	272	544	272	544	272	544	272	544	272	544	272	544	1,360
4. Subtotal	7,942	6,479	10,770	12,939	8,216	12,939	8,216	12,939	8,216	12,939	8,216	12,939	8,216	12,939	8,216	12,939	8,216	12,939	59,323
5. Physical Contingencies	796	648	1,077	1,296	796	1,296	796	1,296	796	1,296	796	1,296	796	1,296	796	1,296	796	1,296	5,932
6. Subtotal	8,738	7,127	11,847	14,235	9,032	14,235	9,032	14,235	9,032	14,235	9,032	14,235	9,032	14,235	9,032	14,235	9,032	14,235	65,255
7. Price Contingencies	1,223	998	4,454	5,360	4,661	7,669	4,661	7,669	4,661	7,669	4,661	7,669	4,661	7,669	4,661	7,669	4,661	7,669	34,565
8. Total (i)	9,961	8,125	16,301	19,615	13,693	21,904	13,693	21,904	13,693	21,904	13,693	21,904	13,693	21,904	13,693	21,904	13,693	21,904	99,820
1. Supply and Installation	1,459	5,907	2,918	23,627	2,189	23,627	2,189	23,627	2,189	23,627	2,189	23,627	2,189	23,627	2,189	23,627	2,189	23,627	7,296
(a) Abu Zuhbi - Matruh East	2,130	7,143	4,260	28,276	3,195	28,276	3,195	28,276	3,195	28,276	3,195	28,276	3,195	28,276	3,195	28,276	3,195	28,276	10,650
(b) Matruh City - Matruh	6,303	3,799	2,212	25,212	2,819	25,212	2,819	25,212	2,819	25,212	2,819	25,212	2,819	25,212	2,819	25,212	2,819	25,212	72,427
(c) Salween - Kamah	2,005	6,725	4,010	26,893	3,017	26,893	3,017	26,893	3,017	26,893	3,017	26,893	3,017	26,893	3,017	26,893	3,017	26,893	67,232
(d) Kamah - Bahalla	444	227	888	906	666	906	666	906	666	906	666	906	666	906	666	906	666	906	2,265
(e) Kamah - Bahalla	444	227	888	906	666	906	666	906	666	906	666	906	666	906	666	906	666	906	2,265
(f) Kamah 500 - Bahalla P. S.	444	227	888	906	666	906	666	906	666	906	666	906	666	906	666	906	666	906	2,265
(g) Tanta II - El Baharian	392	302	1,186	1,208	888	1,208	888	1,208	888	1,208	888	1,208	888	1,208	888	1,208	888	1,208	3,020
(h) El Baharian - Abu Salwan	2,072	1,057	4,144	4,228	3,108	4,228	3,108	4,228	3,108	4,228	3,108	4,228	3,108	4,228	3,108	4,228	3,108	4,228	10,520
(i) El Baharian - El Baharian	1,186	606	2,378	2,416	1,186	2,416	1,186	2,416	1,186	2,416	1,186	2,416	1,186	2,416	1,186	2,416	1,186	2,416	5,980
(j) Damietta - Tala El Bahoud	1,428	631	2,556	3,322	1,428	3,322	1,428	3,322	1,428	3,322	1,428	3,322	1,428	3,322	1,428	3,322	1,428	3,322	11,960
(k) Damietta - Tala El Bahoud	752	606	1,506	2,416	1,128	2,416	1,128	2,416	1,128	2,416	1,128	2,416	1,128	2,416	1,128	2,416	1,128	2,416	9,800
2. Subtotal	16,380	29,928	29,179	119,708	21,884	119,708	21,884	119,708	21,884	119,708	21,884	119,708	21,884	119,708	21,884	119,708	21,884	119,708	372,219
3. Duties and Taxes	1,257	5,028	5,028	9,028	1,257	9,028	1,257	9,028	1,257	9,028	1,257	9,028	1,257	9,028	1,257	9,028	1,257	9,028	12,570
4. Subtotal	17,637	34,956	34,207	128,736	23,141	128,736	23,141	128,736	23,141	128,736	23,141	128,736	23,141	128,736	23,141	128,736	23,141	128,736	484,789
5. Physical Contingencies	15,046	2,953	3,421	11,971	26,912	11,971	26,912	11,971	26,912	11,971	26,912	11,971	26,912	11,971	26,912	11,971	26,912	11,971	384,480
6. Subtotal	32,683	4,609	37,628	131,659	29,403	131,659	29,403	131,659	29,403	131,659	29,403	131,659	29,403	131,659	29,403	131,659	29,403	131,659	869,279
7. Price Contingencies	2,440	6,609	14,748	49,511	19,926	70,963	19,926	70,963	19,926	70,963	19,926	70,963	19,926	70,963	19,926	70,963	19,926	70,963	183,117
8. Total (ii)	19,877	37,530	51,776	181,190	43,529	202,522	43,529	202,522	43,529	202,522	43,529	202,522	43,529	202,522	43,529	202,522	43,529	202,522	608,356
1. Supply and Installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3. Duties and Taxes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Physical Contingencies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Price Contingencies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. Total (iii)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

IN THOUSAND LE

		FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY00		TOTAL	
		LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL	FOREIGN
(a) Sidi Kfir - Amritia																					
(b) Sidi Kfir - Guala																					
(c) Darda - El Debia																					
(d) Sidi Kfir - Amritia																					
(e) Sidi Kfir - Guala																					
(f) Sidi Kfir - Amritia																					
(g) Sidi Kfir - Guala																					
(h) Sidi Kfir - Amritia																					
(i) Sidi Kfir - Guala																					
(j) Sidi Kfir - Amritia																					
(k) Sidi Kfir - Guala																					
(l) Sidi Kfir - Amritia																					
(m) Sidi Kfir - Guala																					
(n) Sidi Kfir - Amritia																					
(o) Sidi Kfir - Guala																					
(p) Sidi Kfir - Amritia																					
(q) Sidi Kfir - Guala																					
(r) Sidi Kfir - Amritia																					
(s) Sidi Kfir - Guala																					
(t) Sidi Kfir - Amritia																					
(u) Sidi Kfir - Guala																					
(v) Sidi Kfir - Amritia																					
(w) Sidi Kfir - Guala																					
(x) Sidi Kfir - Amritia																					
(y) Sidi Kfir - Guala																					
(z) Sidi Kfir - Amritia																					
(aa) Sidi Kfir - Guala																					
(ab) Sidi Kfir - Amritia																					
(ac) Sidi Kfir - Guala																					
(ad) Sidi Kfir - Amritia																					
(ae) Sidi Kfir - Guala																					
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(bn) Sidi Kfir - Amritia																					
(bo) Sidi Kfir - Guala																					
(bp) Sidi Kfir - Amritia																					
(bq) Sidi Kfir - Guala																					
(br) Sidi Kfir - Amritia																					
(bs) Sidi Kfir - Guala																					
(bt) Sidi Kfir - Amritia																					
(bu) Sidi Kfir - Guala																					
(bv) Sidi Kfir - Amritia																					
(bv) To be Commissioned in FY7																					
(c) Abu Kfir - Sidi Kfir																					
1. Supply and Installation																					
2. Subtotal																					
3. Duties and Taxes																					
4. Subtotal																					
5. Physical Contingencies																					
6. Subtotal																					
7. Price Contingencies																					
8. Total (iii)																					
9. Total (iv)																					

EIA INVESTMENT PLAN FY92-99

LIBERIAN POWER PROJECT

EGYPT

IN THOUSAND LE

EBA INVESTMENT PLAN FY92-99

NAMEINVT POWER PROJECT

EGPT

IN THOUSAND LE	E. 132-W Substations																					
	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY00		FY01		FY02	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN
	(1) To be Commissioned in FY99																					
	(a) New N/W																					
	2. Subtotal																					
	3. Duties and Taxes																					
	4. Subtotal																					
	5. Physical Contingencies																					
	6. Subtotal																					
	7. Price Contingencies																					
	8. Total (1)																					
	(2) To be Commissioned in FY96																					
	1. Supply and Installation																					
	(a) Extra P.S.-ELEM																					
	2. Subtotal																					
	3. Duties and Taxes																					
	4. Subtotal																					
	5. Physical Contingencies																					
	6. Subtotal																					
	7. Price Contingencies																					
	8. Total (2)																					
	(3) To be Commissioned in FY96																					
	1. Supply and Installation																					
	(a) High SH-MAIN-FORTEILL																					
	2. Subtotal																					
	3. Duties and Taxes																					
	4. Subtotal																					
	5. Physical Contingencies																					
	6. Subtotal																					
	7. Price Contingencies																					
	8. Total (3)																					
	(4) To be Commissioned in FY96																					
	1. Supply and Installation																					
	(a) Transmission Lines																					
	2. Subtotal																					
	3. Total (4)																					
	9. Total E																					
	F. 132-W Transmission Lines																					
	9. Total E																					
	105,926																					
	105,926																					
	83,055																					
	22,869																					
	56,262																					
	13,668																					
	26,793																					
	13,668																					
	56,262																					
	22,869																					
	83,055																					
	105,926																					

EGYPT

ELDREHAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

	IN THOUSAND LE																		
	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92	FY99	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN			TOTAL
(iii) To be Commissioned in FY99 *																			
1. Supply and Installation (a) Miniya Cement-New Miniya													1,128	1,070	1,504	2,140	2,632	3,210	5,842
2. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	1,128	1,070	1,504	2,140	2,632	3,210	5,842
3. Duties and Taxes	0	0	0	0	0	0	0	0	0	0	0	0	45	90	90	135	135	0	135
4. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	1,173	1,070	1,594	2,140	2,767	3,210	5,977
5. Physical Contingencies	0	0	0	0	0	0	0	0	0	0	0	0	117	107	159	214	276	321	597
6. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	1,290	1,177	1,753	2,354	3,043	3,531	6,574
7. Price Contingencies	0	0	0	0	0	0	0	0	0	0	0	0	1,789	1,085	1,785	2,396	2,974	3,481	6,455
8. Total (iii)	0	0	0	0	0	0	0	0	0	0	0	0	2,479	2,262	3,538	4,750	6,017	7,012	13,029
9. Total F	0	0	3,989	7,223	6,172	16,149	5,412	17,590	366	493	295	518	2,479	2,262	3,538	4,750	22,251	48,985	71,236
c. 66-kV Substations																			
(i) To be Commissioned in FY92																			
1. Supply and Installation (a) Two Substations	3,040	7,311	2,280	7,311													5,320	14,622	19,942
2. Subtotal	3,040	7,311	2,280	7,311	0	0	0	0	0	0	0	0	0	0	0	0	5,320	14,622	19,942
3. Duties and Taxes	307		307		0	0	0	0	0	0	0	0	0	0	0	0	614	0	614
4. Subtotal	3,347	7,311	2,587	7,311	0	0	0	0	0	0	0	0	0	0	0	0	5,934	14,622	20,556
5. Physical Contingencies	335	731	259	731	0	0	0	0	0	0	0	0	0	0	0	0	594	1,462	2,056
6. Subtotal	3,682	8,042	2,846	8,042	0	0	0	0	0	0	0	0	0	0	0	0	6,528	16,084	22,612
7. Price Contingencies	515	1,126	1,070	3,024	0	0	0	0	0	0	0	0	0	0	0	0	1,585	4,150	5,735
8. Total (i)	4,197	9,168	3,916	11,066	0	0	0	0	0	0	0	0	0	0	0	0	8,113	20,234	28,347
(ii) To be Commissioned in FY95																			
1. Supply and Installation (a) Four Substations	7,702	4,712	6,281	9,423	4,711	9,423											18,694	23,558	42,252
2. Subtotal	7,702	4,712	6,281	9,423	4,711	9,423	0	0	0	0	0	0	0	0	0	0	18,694	23,558	42,252
3. Duties and Taxes	198		396		396		0	0	0	0	0	0	0	0	0	0	990	0	990
4. Subtotal	7,900	4,712	6,677	9,423	5,107	9,423	0	0	0	0	0	0	0	0	0	0	19,684	23,558	43,242
5. Physical Contingencies	790	471	668	942	511	942	0	0	0	0	0	0	0	0	0	0	1,969	2,355	4,324
6. Subtotal	8,690	5,183	7,345	10,365	5,618	10,365	0	0	0	0	0	0	0	0	0	0	21,653	25,913	47,566
7. Price Contingencies	1,217	726	2,762	3,897	3,022	5,576	0	0	0	0	0	0	0	0	0	0	7,001	10,199	17,200
8. Total (ii)	9,907	5,909	10,107	14,262	8,640	15,941	0	0	0	0	0	0	0	0	0	0	28,654	36,112	64,766

EGYPT

KUREIHAT POWER PROJECT

SEA INVESTMENT PLAN FY92-99

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92	FY99	TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
(iii) To be Commissioned in FY94																			
1. Supply and Installation (a) Two Substations			3,096	2,318	4,128	4,637	3,096	4,637									10,320	11,592	21,912
2. Subtotal	0	0	3,096	2,318	4,128	4,637	3,096	4,637	0	0	0	0	0	0	0	0	10,320	11,592	21,912
3. Duties and Taxes	0	0	97		195		195		0	0	0	0	0	0	0	0	487	0	487
4. Subtotal	0	0	3,193	2,318	4,323	4,637	3,291	4,637	0	0	0	0	0	0	0	0	10,807	11,592	22,399
5. Physical Contingencies	0	0	319	232	432	464	329	464	0	0	0	0	0	0	0	0	1,080	1,160	2,240
6. Subtotal	0	0	3,512	2,550	4,755	5,101	3,620	5,101	0	0	0	0	0	0	0	0	11,887	12,752	24,639
7. Price Contingencies	0	0	1,321	959	2,558	2,744	2,364	3,331	0	0	0	0	0	0	0	0	6,263	7,034	13,297
8. Total (iii)	0	0	4,833	3,509	7,313	7,845	5,984	8,432	0	0	0	0	0	0	0	0	18,130	19,786	37,916
(iv) To be Commissioned in FY96																			
1. Supply and Installation (a) Five Substations							5,886	5,889	7,848	11,778	5,886	11,778					19,620	29,445	49,065
2. Subtotal	0	0	0	0	0	0	5,886	5,889	7,848	11,778	5,886	11,778	0	0	0	0	19,620	29,445	49,065
3. Duties and Taxes	0	0	0	0	0	0	247		495		495		0	0	0	0	1,237	0	1,237
4. Subtotal	0	0	0	0	0	0	6,133	5,889	8,343	11,778	6,381	11,778	0	0	0	0	20,857	29,445	50,302
5. Physical Contingencies	0	0	0	0	0	0	613	589	834	1,178	638	1,178	0	0	0	0	2,085	2,945	5,030
6. Subtotal	0	0	0	0	0	0	6,746	6,478	9,177	12,956	7,019	12,956	0	0	0	0	22,942	32,390	55,332
7. Price Contingencies	0	0	0	0	0	0	4,405	4,230	6,819	9,626	5,826	10,753	0	0	0	0	17,050	24,609	41,659
8. Total (iv)	0	0	0	0	0	0	11,151	10,708	15,996	22,582	12,845	23,709	0	0	0	0	39,992	56,999	96,991
(v) To be Commissioned in FY97																			
1. Supply and Installation (a) Three Substations									4,645	3,478	6,193	6,956	4,645	6,956			15,483	17,390	32,873
2. Subtotal	0	0	0	0	0	0	0	0	4,645	3,478	6,193	6,956	4,645	6,956	0	0	15,483	17,390	32,873
3. Duties and Taxes	0	0	0	0	0	0	0	0	146		292		292		0	0	730	0	730
4. Subtotal	0	0	0	0	0	0	0	0	4,791	3,478	6,485	6,956	4,937	6,956	0	0	16,213	17,390	33,603
5. Physical Contingencies	0	0	0	0	0	0	0	0	479	348	649	696	494	696	0	0	1,622	1,740	3,362
6. Subtotal	0	0	0	0	0	0	0	0	5,270	3,826	7,134	7,652	5,431	7,652	0	0	17,835	19,130	36,965
7. Price Contingencies	0	0	0	0	0	0	0	0	3,916	2,843	5,921	6,351	5,007	7,055	0	0	14,844	16,249	31,093
8. Total (v)	0	0	0	0	0	0	0	0	9,186	6,669	13,055	14,003	10,438	14,707	0	0	32,679	35,379	68,058

EGYPT

KUREIMAT POWER PROJECT

EEA - INVESTMENT PLAN FY92-99

	IN THOUSAND LE																		
	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL
(vi) To be Commissioned in FY98																			
1. Supply and Installation																			
(a) Four Substations											5,098	5,989	6,797	11,978	5,098	11,978	16,993	29,945	46,938
2. Subtotal	0	0	0	0	0	0	0	0	0	0	5,098	5,989	6,797	11,978	5,098	11,978	16,993	29,945	46,938
3. Duties and Taxes	0	0	0	0	0	0	0	0	0	0	252	503	503	503	503	503	1,258	0	1,258
4. Subtotal	0	0	0	0	0	0	0	0	0	0	5,350	5,989	7,300	11,978	5,601	11,978	18,251	29,945	48,196
5. Physical Contingencies	0	0	0	0	0	0	0	0	0	0	535	599	730	1,198	560	1,198	1,825	2,995	4,820
6. Subtotal	0	0	0	0	0	0	0	0	0	0	5,885	6,588	8,030	13,176	6,161	13,176	20,076	32,940	53,016
7. Price Contingencies	0	0	0	0	0	0	0	0	0	0	6,885	5,468	7,404	12,148	6,272	13,413	18,561	31,029	49,590
8. Total (vi)	0	0	0	0	0	0	0	0	0	0	10,770	12,056	15,434	25,326	12,433	26,589	38,637	63,969	102,606
(vii) To be Commissioned in FY99																			
1. Supply and Installation																			
(a) Seven Substations													10,601	9,333	14,134	18,666	24,735	27,999	52,734
2. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	10,601	9,333	14,134	18,666	24,735	27,999	52,734
3. Duties and Taxes	0	0	0	0	0	0	0	0	0	0	0	0	372	784	784	784	1,176	0	1,176
4. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	10,973	9,333	14,918	18,446	25,911	27,999	53,910
5. Physical Contingencies	0	0	0	0	0	0	0	0	0	0	0	0	1,099	933	1,492	1,867	2,571	2,800	5,391
6. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	12,092	10,266	16,410	20,313	28,502	30,799	59,301
7. Price Contingencies	0	0	0	0	0	0	0	0	0	0	0	0	11,149	9,465	16,705	20,903	27,854	30,368	58,222
8. Total (vii)	0	0	0	0	0	0	0	0	0	0	0	0	23,241	19,731	33,115	41,436	56,356	61,167	117,523
9. Total (viii)	14,104	15,077	18,856	28,837	15,953	23,786	17,135	19,140	25,182	29,251	36,670	49,768	49,113	59,762	45,548	68,025	222,561	293,646	516,207
ix. 66-kV Transmission Lines and Cables																			
(i) To be Commissioned in FY92																			
1. Supply and Installation																			
(a) Lines	731	1,044	731	1,044													1,462	2,088	3,550
2. Subtotal	731	1,044	731	1,044	0	0	0	0	0	0	0	0	0	0	0	0	1,462	2,088	3,550
3. Duties and Taxes	44		44		0	0	0	0	0	0	0	0	0	0	0	0	88	0	88
4. Subtotal	775	1,044	775	1,044	0	0	0	0	0	0	0	0	0	0	0	0	1,550	2,088	3,638
5. Physical Contingencies	78	104	78	104	0	0	0	0	0	0	0	0	0	0	0	0	156	208	364
6. Subtotal	853	1,148	853	1,148	0	0	0	0	0	0	0	0	0	0	0	0	1,706	2,296	4,002
7. Price Contingencies	119	161	321	432	0	0	0	0	0	0	0	0	0	0	0	0	440	595	1,035
8. Total (i)	972	1,309	1,174	1,580	0	0	0	0	0	0	0	0	0	0	0	0	2,146	2,899	5,035

EGYPT

KUREMAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92	FY99	TOTAL	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN		
(ii) To be Commissioned in FY93																				
1. Supply and Installation																				
(a) Lines and Cables	2,387	12,173	3,182	24,346	2,387	24,346											7,956	60,865	68,821	
2. Subtotal	2,387	12,173	3,182	24,346	2,387	24,346	0	0	0	0	0	0	0	0	0	0	7,956	60,865	68,821	
3. Duties and Taxes	511		1,023		1,023												2,557	0	2,557	
4. Subtotal	2,898	12,173	4,205	24,346	3,410	24,346	0	0	0	0	0	0	0	0	0	0	10,513	60,865	71,378	
5. Physical Contingencies	290	1,217	421	2,435	341	2,435	0	0	0	0	0	0	0	0	0	0	1,052	6,067	7,139	
6. Subtotal	3,188	13,390	4,626	26,781	3,751	26,781	0	0	0	0	0	0	0	0	0	0	11,565	66,952	78,517	
7. Price Contingencies	446	1,875	1,739	10,070	2,018	14,408	0	0	0	0	0	0	0	0	0	0	4,203	26,353	30,556	
8. Total (ii)	3,634	15,265	6,365	36,851	5,769	41,189	0	0	0	0	0	0	0	0	0	0	15,768	93,305	109,073	
(iii) To be Commissioned in FY96																				
1. Supply and Installation																				
(a) Lines and Cables			1,018	15,596	1,357	31,192	1,018	31,192									3,393	77,980	81,373	
2. Subtotal	0	0	1,018	15,596	1,357	31,192	1,018	31,192	0	0	0	0	0	0	0	0	3,393	77,980	81,373	
3. Duties and Taxes	0	0	655		1,310		1,310		0	0	0	0	0	0	0	0	3,275	0	3,275	
4. Subtotal	0	0	1,673	15,596	2,667	31,192	2,328	31,192	0	0	0	0	0	0	0	0	6,668	77,980	84,648	
5. Physical Contingencies	0	0	167	1,560	267	3,119	233	3,119	0	0	0	0	0	0	0	0	667	7,798	8,465	
6. Subtotal	0	0	1,840	17,156	2,934	34,311	2,561	34,311	0	0	0	0	0	0	0	0	7,335	85,778	93,113	
7. Price Contingencies	0	0	692	6,451	1,578	18,459	1,672	22,405	0	0	0	0	0	0	0	0	3,942	47,315	51,257	
8. Total (iii)	0	0	2,532	23,607	4,512	52,770	4,233	56,716	0	0	0	0	0	0	0	0	11,277	133,093	144,370	
(iv) To be Commissioned in FY96																				
1. Supply and Installation																				
(a) Lines and Cables							2,985	15,216	3,977	30,433	2,985	30,433					9,943	76,082	86,025	
2. Subtotal	0	0	0	0	0	0	2,985	15,216	3,977	30,433	2,985	30,433	0	0	0	0	9,943	76,082	86,025	
3. Duties and Taxes	0	0	0	0	0	0	639		1,278		1,278		0	0	0	0	3,195	0	3,195	
4. Subtotal	0	0	0	0	0	0	3,622	15,216	5,255	30,433	4,261	30,433	0	0	0	0	13,138	76,082	89,220	
5. Physical Contingencies	0	0	0	0	0	0	362	1,522	526	3,043	426	3,043	0	0	0	0	1,314	7,608	8,922	
6. Subtotal	0	0	0	0	0	0	3,984	16,738	5,781	33,476	4,687	33,476	0	0	0	0	14,452	83,690	98,142	
7. Price Contingencies	0	0	0	0	0	0	2,602	10,930	4,295	24,873	3,890	27,785	0	0	0	0	10,787	63,588	74,375	
8. Total (iv)	0	0	0	0	0	0	6,586	27,668	10,076	58,349	8,577	61,261	0	0	0	0	25,239	147,278	172,517	

EGYPT

ELREINAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

(IN THOUSAND LE)

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL	
(v) To be Commissioned in FY97																				
1. Supply and Installation (a) Lines									1,018	15,596	1,357	31,192	1,018	31,192			3,393	77,980	81,373	
2. Subtotal	0	0	0	0	0	0	0	0	1,018	15,596	1,357	31,192	1,018	31,192	0	0	3,393	77,980	81,373	
3. Duties and Taxes	0	0	0	0	0	0	0	0	655		1,310		1,310		0	0	3,275	0	3,275	
4. Subtotal	0	0	0	0	0	0	0	0	1,673	15,596	2,667	31,192	2,328	31,192	0	0	6,668	77,980	84,648	
5. Physical Contingencies	0	0	0	0	0	0	0	0	167	1,560	267	3,119	233	3,119	0	0	667	7,798	8,465	
6. Subtotal	0	0	0	0	0	0	0	0	1,840	17,156	2,934	34,311	2,561	34,311	0	0	7,335	85,778	93,113	
7. Price Contingencies	0	0	0	0	0	0	0	0	1,367	12,747	2,435	28,478	2,361	31,635	0	0	6,163	72,860	79,023	
8. Total (v)	0	0	0	0	0	0	0	0	3,207	29,903	5,369	62,789	4,922	65,946	0	0	13,498	158,638	172,136	
(vi) To be Commissioned in FY99																				
1. Supply and Installation (a) Cables													3,349	9,464	4,615	21,714	7,964	31,178	39,142	
2. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	3,349	9,464	4,615	21,714	7,964	31,178	39,142	
3. Duties and Taxes	0	0	0	0	0	0	0	0	0	0	0	0	397	964	912	21,714	1,309	0	1,309	
4. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	3,746	9,464	5,527	21,714	9,273	31,178	40,451	
5. Physical Contingencies	0	0	0	0	0	0	0	0	0	0	0	0	375	946	553	2,171	928	3,117	4,045	
6. Subtotal	0	0	0	0	0	0	0	0	0	0	0	0	4,121	10,410	6,080	23,885	10,201	34,295	44,496	
7. Price Contingencies	0	0	0	0	0	0	0	0	0	0	0	0	3,800	9,598	6,189	24,315	9,989	33,913	43,902	
8. Total (vi)	0	0	0	0	0	0	0	0	0	0	0	0	7,921	20,008	12,269	48,200	20,190	68,208	88,398	
9. Total II	4,606	16,574	10,071	62,038	10,281	93,999	10,819	84,384	13,283	88,252	13,946	124,050	12,843	85,954	12,269	48,200	88,118	603,411	691,529	
10. Total II (Transmission)	56,933	104,558	158,479	493,138	243,482	969,925	235,493	877,743	287,094	876,322	260,372	907,894	200,194	608,049	121,669	337,750	1,563,716	5,175,379	6,739,095	
11. Total I+II (Gen. + Trans.)	181,489	918,952	336,329	1,483,808	541,017	3,204,232	665,578	3,459,117	814,215	3,385,979	899,978	3,824,053	837,266	3,489,603	630,027	2,697,242	4,905,899	22,462,986	27,368,885	

EGYPT

KUREIMAT POWER PROJECT

EEA INVESTMENT PLAN FY92-99

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY00		FY01	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN		TOTAL
I. Generation (Additional Requirements)																				
A. Rehabilitation																				
1. Supply and Installation (i) Rehabilitation	26,315	98,065	21,200	140,320	32,000	184,640	48,000	240,000	56,000	320,000	80,000	560,000	52,880	712,000	64,000	497,040	380,395	2,752,065	3,132,460	
2. Subtotal	26,315	98,065	21,200	140,320	32,000	184,640	48,000	240,000	56,000	320,000	80,000	560,000	52,880	712,000	64,000	497,040	380,395	2,752,065	3,132,460	
3. Duties and Taxes	4,119		5,895		7,755		10,080		13,440		23,520		29,904		20,876		115,587	0	115,587	
4. Subtotal	30,434	98,065	27,095	140,320	39,755	184,640	58,080	240,000	69,440	320,000	103,520	560,000	82,784	712,000	84,876	497,040	495,982	2,752,065	3,248,047	
5. Physical Contingencies	3,043	9,807	2,709	14,032	3,976	18,464	5,808	24,000	6,944	32,000	10,352	56,000	8,278	71,200	8,488	49,704	49,598	275,207	324,805	
6. Subtotal	33,477	107,872	29,802	154,352	43,731	203,104	63,888	264,000	76,384	352,000	113,872	616,000	91,062	783,200	93,364	546,744	545,580	3,027,272	3,572,852	
7. Price Contingencies	4,687	15,102	11,206	58,036	23,527	109,270	41,719	172,392	56,753	261,536	94,514	511,280	83,959	722,110	95,045	556,585	411,410	2,406,311	2,817,721	
8. Total (i)	38,164	122,974	41,008	212,388	67,258	312,374	105,607	436,392	133,137	613,536	208,386	1,127,280	175,021	1,505,310	188,409	1,103,329	956,990	5,433,583	6,390,573	
B. Isolated Generation																				
1. Supply and Installation (i) Isolated Generation	15,992	20,290	16,500	25,308	13,200	24,642	13,000	23,976	12,500	23,310	12,000	22,644	0	0	0	0	83,192	140,170	223,362	
2. Subtotal	15,992	20,290	16,500	25,308	13,200	24,642	13,000	23,976	12,500	23,310	12,000	22,644	0	0	0	0	83,192	140,170	223,362	
3. Duties and Taxes	852		1,063		1,035		1,007		979		951		0		0		5,887	0	5,887	
4. Subtotal	16,844	20,290	17,563	25,308	14,235	24,642	14,007	23,976	13,479	23,310	12,951	22,644	0	0	0	0	89,079	140,170	229,249	
5. Physical Contingencies	1,684	2,029	1,756	2,531	1,424	2,654	1,401	2,398	1,348	2,331	1,295	2,264	0	0	0	0	8,908	16,017	22,925	
6. Subtotal	18,528	22,319	19,319	27,839	15,659	27,296	15,408	26,374	14,827	25,641	14,246	24,908	0	0	0	0	97,987	156,187	252,174	
7. Price Contingencies	2,594	3,125	7,264	10,467	8,425	14,583	10,061	17,222	11,016	19,051	11,824	20,674	0	0	0	0	51,184	85,122	136,306	
8. Total (i)	21,122	25,444	26,583	38,306	24,084	41,879	25,469	43,596	25,843	44,692	26,070	45,582	0	0	0	0	149,171	239,309	388,480	
9. Total (A+B)	59,286	148,418	67,591	250,694	91,342	354,063	131,076	479,988	158,980	658,228	234,456	1,172,862	175,021	1,505,310	188,409	1,103,329	1,106,161	5,672,892	6,779,053	
II. Transmission Lines (Addn. Requirements)																				
A. Rehabilitation																				
1. Supply and Installation (i) Rehabilitation	3,810	42,771	5,383	35,874	8,208	48,140	12,455	64,356	14,620	85,937	20,290	142,769	13,510	180,767	16,122	125,447	94,398	726,061	820,659	
2. Subtotal	3,810	42,771	5,383	35,874	8,208	48,140	12,455	64,356	14,620	85,937	20,290	142,769	13,510	180,767	16,122	125,447	94,398	726,061	820,659	
3. Duties and Taxes	1,796		1,507		2,022		2,703		3,609		5,996		7,992		5,289		30,494	0	30,494	
4. Subtotal	5,606	42,771	6,890	35,874	10,230	48,140	15,158	64,356	18,229	85,937	26,286	142,769	21,102	180,767	21,391	125,447	124,892	726,061	850,953	
5. Physical Contingencies	561	4,277	689	3,587	1,023	4,814	1,516	6,436	1,823	8,594	2,629	14,277	2,110	18,077	2,139	12,545	12,490	72,607	85,097	
6. Subtotal	6,167	47,048	7,579	39,461	11,253	52,954	16,674	70,792	20,052	94,531	28,915	157,046	23,212	198,844	23,530	137,992	137,382	798,668	936,050	
7. Price Contingencies	863	6,587	2,850	14,637	6,054	28,489	10,888	46,227	14,899	70,237	23,999	130,348	21,401	185,334	23,954	140,476	104,908	620,533	723,443	
8. Total (i)	7,030	53,635	10,429	54,098	17,307	81,443	27,562	117,019	34,951	164,768	52,914	287,394	44,613	382,178	47,484	278,468	242,290	1,419,203	1,661,493	

EGYPT

KUREIMAT POWER PROJECT

CEA INVESTMENT PLAN FY92-99

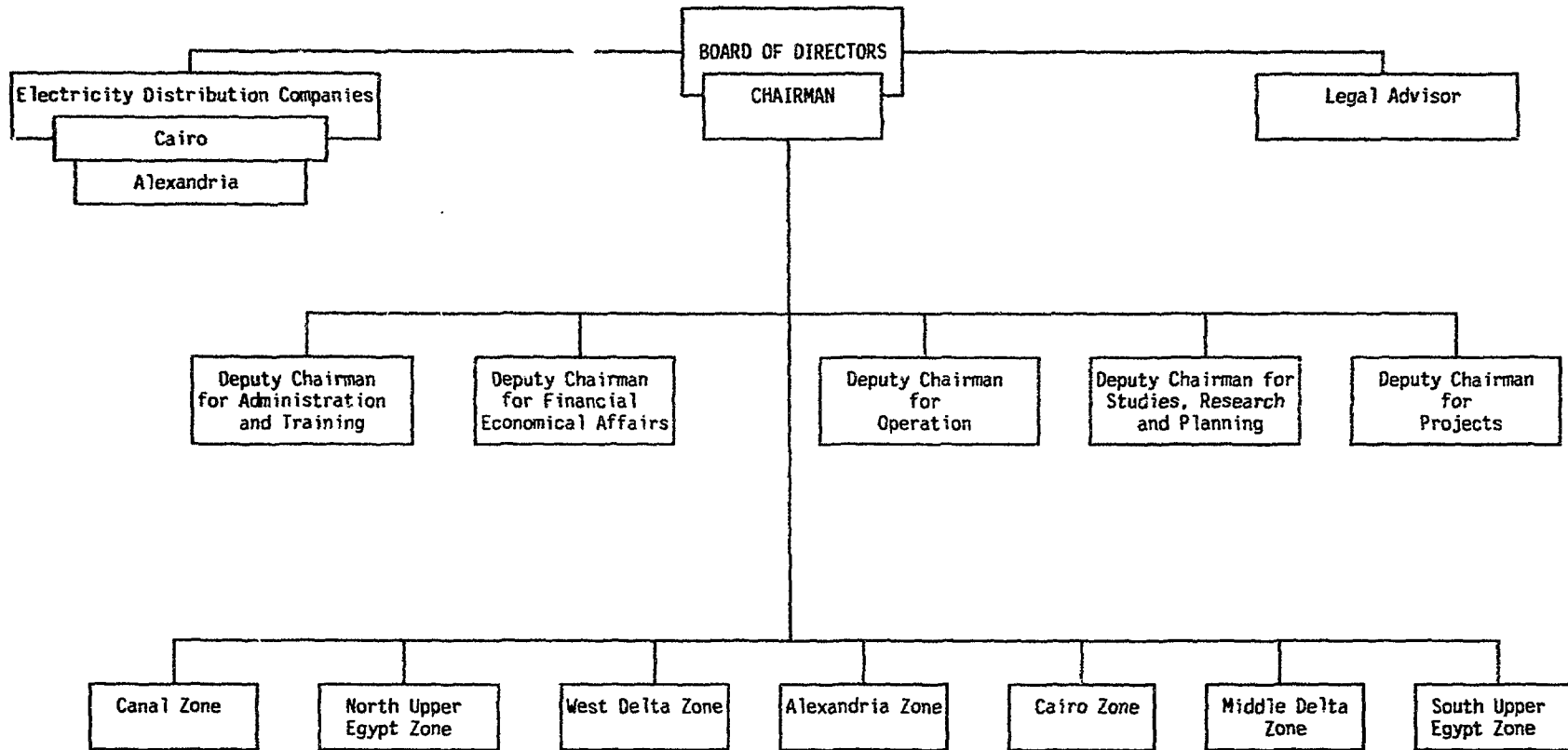
IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99		
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL
B. Control Centers																					
1. Supply and Installation																					
(i) Control Centers	4,665	17,359	4,500	21,702	5,000	25,601	5,500	29,201	0	27,999	0	31,299	0	34,599	0	37,999	19,665	225,759	265,424		
2. Subtotal	4,665	17,359	4,500	21,702	5,000	25,601	5,500	29,201	0	27,999	0	31,299	0	34,599	0	37,999	19,665	225,759	265,424		
3. Duties and Taxes	729		911		1,075		1,226		1,176		1,315		1,453		1,596		9,481	0	9,481		
4. Subtotal	5,394	17,359	5,411	21,702	6,075	25,601	6,726	29,201	1,176	27,999	1,315	31,299	1,453	34,599	1,596	37,999	29,146	225,759	254,905		
5. Physical Contingencies	539	1,756	541	2,170	606	2,560	673	2,920	118	2,800	132	3,130	145	3,460	160	3,800	2,916	22,576	25,492		
6. Subtotal	5,933	19,095	5,952	23,872	6,683	28,161	7,399	32,121	1,294	30,799	1,447	34,429	1,598	38,059	1,756	41,799	32,062	248,335	280,397		
7. Price Contingencies	831	2,673	2,238	8,976	3,595	15,151	4,832	20,975	961	22,884	1,201	28,576	1,473	35,090	1,788	42,551	16,919	176,876	195,795		
8. Total (i)	6,764	21,768	8,190	32,848	10,278	43,312	12,231	53,096	2,255	53,683	2,648	63,005	3,071	73,149	3,544	84,350	48,981	425,211	474,192		
9. Total (A+B)	13,796	75,403	18,619	87,146	27,505	124,755	39,793	170,115	37,206	218,451	55,562	350,399	47,684	455,327	51,028	362,818	291,271	1,844,414	2,135,685		
III. Training and Miscellaneous Requirements																					
A. Training and Miscellaneous																					
1. Supply and Installation																					
(i) Training & Misc.	21,741	17,479	14,076	22,877	15,627	32,448	16,995	31,698	687	10,539	9,330	19,950	9,130	18,235	10,125	15,125	97,711	168,351	266,062		
2. Subtotal	21,741	17,479	14,076	22,877	15,627	32,448	16,995	31,698	687	10,539	9,330	19,950	9,130	18,235	10,125	15,125	97,711	168,351	266,062		
3. Duties and Taxes	734		961		1,363		1,351		443		838		766		635		7,071	0	7,071		
4. Subtotal	22,475	17,479	15,037	22,877	16,990	32,448	18,326	31,698	1,130	10,539	10,168	19,950	9,896	18,235	10,760	15,125	104,782	168,351	273,133		
5. Physical Contingencies	2,248	1,748	1,504	2,288	1,699	3,245	1,833	3,170	113	1,054	1,017	1,995	990	1,824	1,076	1,513	10,480	16,837	27,317		
6. Subtotal	24,723	19,227	16,541	25,165	18,689	35,693	20,159	34,868	1,243	11,593	11,185	21,945	10,886	20,059	11,836	16,638	115,262	185,188	300,450		
7. Price Contingencies	3,461	2,692	6,219	9,462	10,053	19,203	13,164	22,769	924	8,614	9,284	18,214	10,037	18,494	12,049	16,937	65,193	116,385	181,578		
8. Total (i)	28,184	21,919	22,760	34,627	28,744	54,896	33,323	57,637	2,167	20,207	20,469	40,159	20,923	38,553	23,885	33,575	180,455	301,573	482,028		
9. Total I - Generation	185,842	962,812	245,441	1,241,344	389,877	2,588,370	561,161	3,061,362	686,101	3,167,885	874,062	4,089,021	812,093	4,386,864	696,767	3,462,821	4,448,344	22,960,499	27,408,843		
10 Total II - Transmission	70,727	179,961	177,098	580,284	271,067	1,094,680	275,286	1,047,858	324,300	1,094,773	315,934	1,258,293	247,878	1,063,376	172,697	700,568	1,854,967	7,019,793	8,874,780		
11 Total III - Training & Misc.	28,184	21,919	22,760	34,627	28,744	54,896	33,323	57,637	2,167	20,207	20,469	40,159	20,923	38,553	23,885	33,575	180,455	301,573	482,028		
11 Total I+II+III	282,753	1,164,692	445,299	1,856,275	689,688	3,737,946	869,770	4,166,857	1,012,568	4,282,865	1,210,465	5,387,473	1,080,894	5,488,793	893,349	4,196,964	6,483,786	30,281,865	36,765,651		

EGYPT

KUREIMAT POWER PROJECT

Organization Chart for the Egyptian Electricity Authority



EGYPT

KUREIMAT POWER PROJECT

Details of the Project Components

A. General

1. The project is designed to assist EEA in: (i) alleviating power shortages; (ii) meeting the growing demand for electricity; (iii) improving the efficiency and reliability of EEA's interconnected system; (iv) improving EEA's financial position; and (v) improving technical and managerial skills of EEA's staff. The project consists of four components, namely: (a) Kureimat power station; (b) gas interconnection (pipeline); (c) transmission lines (including substations); and (d) technical assistance. The components are described in detail in the following paragraphs.

B. Component I (Kureimat Power Station)

2. Project Origin. To meet future demand for electricity, EEA with the funding from USAID initiated a feasibility study for a coal-fired thermal power station with a net installed capacity of 1,200 MW. In 1984, with the high oil prices and uncertainty about availability of natural gas, coal was considered as an economic option for generation of electricity in the power stations. This was also the conclusion of the "Power Generation Investment Review" (October 1985) carried out by the Bank. The feasibility study was completed in 1986. However, the fall in petroleum prices in 1986 and the incentives given to the drilling companies under the new "gas clause" approved by the Egyptian parliament in early 1988, changed the Government's views regarding availability of natural gas for power generation. The change in view led to the Government/EEA approval of: Damietta and Cairo South combined cycle power stations; and conversion of the existing "open cycle" combustion turbines at Talkha, Mahmoudia and Damanhour power stations into more efficient combined cycle mode of operation of the turbines. In parallel, EEA with USAID funding carried out a supplemental study (with the consultants, S & W, appointed for the feasibility study) for evaluating the future availability of natural gas for power generation. The supplemental study indicated that the availability of natural gas was restricted and was not adequate to assure 100 percent availability for the generation of electricity in the combined cycle plants. Therefore, generation of electricity in a dual fuel (natural gas and fuel oil) fired thermal plant would be the least-cost solution. Accordingly, the consultants, S & W, revised the feasibility study and after comparing the costs for oil, gas, coal and combined cycle plants located at five potential sites (Attaq, Cairo North, Gamasa, Mit Chamr and Kureimat) concluded that the dual fuel fired thermal power station at Kureimat is the lowest cost solution to meet the future electricity demand in FY96-97.

3. Site Selection. The generation expansion analysis carried by S & W confirmed that 600 MW was the appropriate size for UPS. Accordingly the cost analysis for installation of a net 1,200 MW (2x600 MW) dual fuel fired power station at the five potential sites (para. 2) was carried out taking

into account the costs of: (i) fuel supply; (ii) water supply; (iii) power transmission connecting the power station to the electrical network; (iv) infrastructure (site preparation, demolition, access roads, foundations, final grading, security wall, colony, transportation of construction equipment and materials, size of labor force and establishment of labor camps); and (v) environmental control. The methodology for site selection also included sensitivity and risk analysis. Expected values of present worth site costs in US\$ million for the five sites were: Kureimat (located on the Nile) - US\$359.2; Ataq (located on the Gulf of Suez) - US\$403.1, Cairo North - US\$412.5, Mit Chamr (located in the Delta region) - US\$438.0; and Gamasa (located on the Mediterranean) - US\$577.3. Based on the analysis, Kureimat power station site was found to be the lowest cost solution for establishment of the future generation capacity.

4. Kureimat Power Station Site. The proposed power station site is located on the east bank of river Nile about 95 km south of Cairo in Giza Governorate, and is 30 km north of Beni Suef and just downstream of Kureimat Island. EEA has acquired about 840,000 m² of land for the power station and the colony, out of which about 210,000 m² of land along the river was occupied by 96 farmers for cultivation. The land was used for cultivation by the farmers living in the nearby villages. EEA deposited with ESA the amount of about LE 950,000 determined by ESA as necessary to compensate all 96 farmers for the agricultural land acquired for the project. In addition, to avoid any social stress caused by the land acquired for the power station, EEA, local members of the Parliament and the Village Council reached an agreement that: (a) EEA would give priority to the farmers and/or their children while filling in jobs at the site; (b) EEA would allow the farmers to raise crops on the piece of land cultivated by the farmers till the piece of land was required for the works for the power station; and (c) EEA would try to use its influence with the Giza Governorate in obtaining priority for allocation of the newly reclaimed land by the Governorate in the nearby areas.

5. Steam Generators. Under full load conditions (about 1260 MW), the two dual fuel-fired reheat steam generators (boilers) would have a heat input of 2.97×10^9 kcal/hr while burning natural gas and 2.87×10^9 kcal/hr while burning fuel oil. It would generate superheated (live) steam at 180 bar (about 2,600 psig) and 538°C. The reheat steam from the steam turbine at 41 bar (597 psig) and 450°C would be reheated in the boiler and sent back to the turbine at a temperature of 538°C. The efficiency of boiler on Higher Heating Value basis would be about 88 percent for fuel oil and about 85 percent for natural gas. Fuel usage, per boiler, based on 70 percent plant capacity factor would amount to 936 million m³ of natural gas (having a HHV of 9,718 kcal/m³ or 12,423 kcal/kg) or about 0.9 million mt of fuel oil (having a HHV of 10,060 kcal/kg). The fuel oil supply would be from a 14-inch fuel oil pipeline (from Mostorod refinery to Beni Suef) which runs by the power station. Component II (para. 10) covers the supply of material and equipment for installation of the pipeline supplying natural gas to the power station. The steam generators would be of pressurized furnace design and provided with fuel gas recirculation to control the heat absorption pattern under varying operating conditions. Air input rate to the boiler is estimated at 4,656 mt/hour for natural gas and 5,237 mt/hour for fuel oil.

6. Steam Turbines. The two tandem compound, four flow, single reheat steam turbines with a net capacity of 600 MW each (about 630 MW gross) would each be supplied with about 1,935 mt/hr of live steam at 175 bar (about 2,500 psig) and 538°C, and reheat steam at about 37 bar (540 psig) and 538°C. The exhaust steam flowing into the condensers at a pressure of 2.5 inches of mercury absolute (about 1.2 psig) would be condensed by the circulating water flowing through the condensers at the rate of 1,200 m³/min). In the process, the circulating water temperature rises by about 10°C above the circulating water intake temperature. The turbine cycle heat rejection rate is 1.44x10⁹ kcal/hr. The plant heat rate (based on net generation and HHV) is estimated to be 2,473 kcal/kWh for natural gas and about 2,389 kcal/kWh for fuel oil. The power station auxiliary consumption is estimated at 5 percent of the gross generation.

7. Station Auxiliaries. The power station would be provided with auxiliary equipment for: (a) the fuel handling system; (b) the circulating water system; (c) the circulating water, potable water, boiler make water, service water, and wastewater treatment system; (d) the seven stage (including deaerator) feedwater heating system; (e) the condensate polishing system; (f) the hydrogen, nitrogen and bulk carbon dioxide storage systems; chemical, and instrumentation and controls laboratories; (g) the plant waste treatment system; (h) the fire protection system, heating, ventilation and air conditioning system, and other miscellaneous auxiliary equipment.

8. Colony. The colony would provide housing units and facilities for 418 out of 533 staff members based on an average occupancy of five persons per unit. The balance staff (mostly unskilled) is presumed to come from nearby villages. Since adequate public services are not available in the nearby villages and to avoid overloading the existing services in the villages, public services to be provided for the colony would comprise: (a) telephone, telegram and post office; (b) police and fire department; (c) colony administration building; (d) nursery; (e) primary school (including playgrounds) for about 400 students; (f) commercial center; (g) hospital, guest house, and religious and recreational facilities; and (h) potable water supply, sanitary drainage, telephone exchange and electricity.

9. Construction Infrastructure. Offices for EEA and its contractors would be located at the site. During the peak of activity, construction labor force of about 3,000 is estimated. An area would be designated for each contractor for construction of his site office and camp for his labor force. Colony housing activity would be initiated early to ensure housing for EEA staff at site. Construction requirements for electricity, water and sanitary drainage system would be provided. Equipment would be transported by road and use of the Nile river would be made, especially, for transportation of heavy equipment.

C. Component II (Natural Gas Pipeline)

10. Natural gas for the power station would be supplied by tapping (at

Zafarana) the existing Ras Shokir-Port Said natural gas pipeline and laying about 162-km of a 20-inch diameter natural gas pipeline to the power station site. Natural gas supplied at about 100 bar (about 1,450 psig) would be reduced at the pressure reducing and metering station to about 7 bar (about 100 psig) for use in the boilers. EGPC would provide alternate natural gas supply by laying a 90-km of 24-inch diameter natural gas pipeline from El Tebbin to Kureimat is also planned by EGPC. Natural gas at a pressure of 30 bar supplied from the pipeline would be reduced to 7 bar (for use in the boilers) at the pressure reducing and metering station provided at the power station site. The pipeline would be chemically coated from inside and outside to prevent corrosion. As mentioned in para. 4.06 of the main report, the Bank funding would be for supply of material, tools, fittings and equipment required for the pipeline and pressure reducing station. EGPC would award the installation contract to PETROJET, a company under EGPC's control, and for reasons given in paras. 4.09 and 4.18, the installation of the pipeline is considered as reserved procurement.

D. Component III (Transmission Lines and Substation)

11. The component provides for supply and installation of: (a) about 150 km of 500-kV transmission lines for interconnecting the power station switchyard with the existing 500-kV Aswan High Dam-Cairo transmission lines; (b) about 60 km of 220-kV Tanta-Kalyobea transmission line; (c) about 30 km of 220-kV Abu Sultan-Manyef 200-kV transmission line; (d) replacement of the existing 220-kV circuit breakers of 7,000 MVA rupturing capacity with 13 220-kV GIS breakers of 15,000 MVA capacity and addition of a 220/66/11-kV 125 MVA capacity transformer to meet the increased demand for power; and (e) installation of about 76 3.6 MVAR capacitor banks and 42 5.4 MVAR capacitor banks at 53 substations in EEA's interconnected system to assist EEA in reduction of line losses and improvement of voltage conditions at the substations.

E. Component IV (Technical Assistance)

12. Engineering consultancy Services. The subcomponent provides for the engineering services (funded by USAID) for preconstruction, construction and commissioning phases of Component I and 500-kV transmission lines under Component III. The engineering consultant would also be responsible for procurement, installation, operation and maintenance of environmental monitoring stations, and meteorological equipment for: (a) taking measurements of background pollution for at least one year before the start of construction at the site; (b) taking measurements of physical conditions and hydrology of the Nile river at the site; (c) submission of semi-annual environmental report till the construction activity starts at the site; and (d) training EEA staff in so that the staff would continue the environmental measurement activities during the operation of the plant. It is estimated that about 1,500 foreign and 1,000 local expert-months would be required for the activity. The schedule for important environmental activities to be carried out by the consultants is as follows: (a) signing of the consultancy contract by December 1991; (b) receipt of the environmental equipment at the site by December 1992; (c) start environmental measurement at the site by

March 1993; (d) submission of the first semi-annual report by October 1993; and (e) the end of measurement and submission of the final background pollution report for the site by March 1994.

13. Training Consultancy Services and Equipment. To train EEA staff and trainers in instrumentation controls practices necessary for efficient operation of a modern power station, the Bank had funded the first phase of training EEA staff in instrumentation and controls under the supplemental Loan 1886-1-EGT for the Third Power Project. Second phase of training for EEA staff in instrumentation and controls would be provided under the subcomponent and, accordingly, would include funding for about 12 expert-months and 60 trainee-months. In addition, the funding for the training equipment for the training center to be established in North Upper Egypt is provided under the subcomponent.

14. Data Bank/Management Information System (MIS). EEA has the basic equipment for the data bank/MIS system (para. 2.14 of the main report), however, additional hardware, and application and communication software is needed for efficient data collection from various data centers. At present MIS available with EEA lacks hardware and software for a project management system which would provide for monitoring of construction activities of projects and would include systems for: (a) PERT/CPM, Gantt chart, precedence and other techniques; (b) resource levelling and project costing; and (c) progress report generation systems. To ensure timely implementation of these activities, funding for About 10 expert-months of consultancy services is provided.

15. Financial Management Consultancy Services. To minimize the risk of EEA not achieving the financial targets in future and to keep the future tariff increases to the minimum, EEA needs to minimize operating expenses by controlling costs. Accordingly, about 100 expert months of consultancy services (including training of EEA staff) is provided for assisting EEA in implementation of a computerized financial management system with a special emphasis on introduction of effective cost control systems. More details are given in the Terms of Reference in Annex 5.7.

16. Load Management Equipment. With the implementation of weighted average electricity price increases to reflect the LRMC based tariffs by FY95, implementation of load management techniques and energy conservation measures would be essential. The previous Bank-funded power projects in Egypt provided funds for load research and load management studies. In addition, the initial draft report of the Tariff Study funded by USAID (scheduled for completion by December 1991) recommended the use of special metering for bulk consumers and bulk supply points for EDCs. Accordingly, funding for procurement of about 1,000 special meters is provided under the subcomponent.

17. Funding of Bid Packages. Table 1 below gives the funding for various bid packages for the project.

Table 1
Funding of Bid Packages
(In Million US\$)

	<u>LOCAL</u>	<u>FOREIGN</u>	<u>TOTAL</u>
A. <u>Funded by IBRD/EEA</u>			
1. Mechanical Piping and Equipment Erection	15.8	67.8	83.6
2. Supply of Instrumentation and Controls	2.0	32.6	34.6
3. Training Simulator Supply and Installation	1.3	3.9	5.2
4. Supply of Gas Pipeline Material, Fittings, Tools, and Pipeline Coating Materials	10.6	41.2	51.8
5. Transmission Lines, Substation Rehabilitation and Line Loss Reduction Equipment	26.0	65.1	91.1
6. Training Consultancy Services and Equipment	0.6	5.5	6.1
7. Data Bank, MIS, and financial Consultancy Services and Equipment	0.5	3.3	3.8
8. Load Management Equipment	<u>0.1</u>	<u>0.6</u>	<u>0.7</u>
Total A	56.9	220.0	276.9
B. <u>Funded by African Development Bank (ADB)/EEA</u>			
1. Structural Piling	2.8	5.5	8.3
2. Station Civil Works & Structural Steel	45.4	103.0	148.4
3. Steam Generators Supply and Erection	38.7	166.5	205.2
4. Supply of Water and Waste Treatment Systems	1.3	22.9	24.2
5. Supply of Feed Water Heaters, Deaerators and Condensers	1.4	23.5	24.9
6. Supply of Pumps and Drives	1.5	25.1	26.6
7. Yard Tanks Supply and Erection	6.5	7.1	13.6
8. Power Station Interconnection to the Grid	<u>13.8</u>	<u>25.8</u>	<u>39.6</u>
Total B	111.4	379.4	490.8
C. <u>Funded by Arab Fund (AFESD)/EEA</u>			
1. Supply of Piping, Valves and Misc. Equipment	4.6	32.6	37.2
2. Supply of Electrical Distribution & Auxiliary Equipment	5.0	48.9	53.9
3. Electrical/Instrument and Controls Erection	<u>15.7</u>	<u>56.0</u>	<u>71.7</u>
Total C	25.3	137.5	162.8
D. <u>U.S. Agency for International Development/EEA</u>			
1. Steam Turbine/Generator Supply and Erection	18.2	158.1	176.3
2. Eng. Consultancy Services (incl. Env. Equipment)	<u>10.3</u>	<u>35.7</u>	<u>46.0</u>
Total D	28.5	193.8	222.3
E. <u>Government of Saudi Arabia/EEA</u>			
1. Power Station Switchyard Supply and Erection	<u>16.5</u>	<u>60.1</u>	<u>76.6</u>
Total E	16.5	60.1	76.6
F. <u>EEA</u>			
1. Land for Power Station and Colony	0.5	0.0	0.5
2. Civil Works for the Colony	21.7	1.7	23.4
3. Wrap-up Insurance	<u>0.0</u>	<u>7.6</u>	<u>7.6</u>
Total F	22.2	9.3	31.5
G. <u>EGPC</u>			
1. Pipeline Erection (Reserved Procurement)	<u>6.0</u>	<u>0.0</u>	<u>6.0</u>
Total G	6.0	0.0	6.0

EGYPT

KUREIMAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND LE																				
		FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY99		
		LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL
I. Kureimat Power Station																				
A. Land, Civil Works and Colony																				
(i) Land and Geotechnical Services																				
1. Land -Power Station & Colony		1,320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,320	0	1,320
2. Geotechnical Services		231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231	0	231
3. Subtotal		1,551	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,551	0	1,551
4. Physical Contingencies		35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	35
5. Subtotal		1,586	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,586	0	1,586
6. Price Contingencies		222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	222	0	222
7. Total (i)		1,808	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,808	0	1,808
(ii) Structural Piling																				
1. Supply and Erection		0	0	650	1,409	2,607	5,633	2,607	5,633	650	1,409	0	0	0	0	0	0	6,514	14,084	20,598
2. Duties and Taxes		0	0	68	270	270	676	270	676	68	270	0	0	0	0	0	0	676	0	676
3. Subtotal		0	0	718	1,409	2,877	5,633	2,877	5,633	718	1,409	0	0	0	0	0	0	7,190	14,084	21,274
4. Physical Contingencies		0	0	108	211	432	865	432	865	108	211	0	0	0	0	0	0	1,080	2,112	3,192
5. Subtotal		0	0	826	1,620	3,309	6,478	3,309	6,478	826	1,620	0	0	0	0	0	0	8,270	16,196	24,466
6. Price Contingencies		0	0	311	609	1,780	3,465	2,161	4,230	614	1,204	0	0	0	0	0	0	4,866	9,528	14,394
7. Total (ii)		0	0	1,137	2,229	5,089	9,963	5,470	10,708	1,440	2,824	0	0	0	0	0	0	13,136	25,724	38,860
(iii) Structural Steel																				
1. Supply and Erection		0	0	0	0	3,033	12,616	9,098	37,851	9,098	37,851	6,065	25,235	3,033	12,616	0	0	30,327	126,569	156,496
2. Duties and Taxes		0	0	0	0	606	1,817	1,817	1,817	1,817	1,211	606	606	606	606	0	0	6,057	0	6,057
3. Subtotal		0	0	0	0	3,639	12,616	10,915	37,851	10,915	37,851	7,276	25,235	3,639	12,616	0	0	36,384	126,169	162,553
4. Physical Contingencies		0	0	0	0	364	1,262	1,392	3,785	1,092	3,785	728	2,524	364	1,262	0	0	3,640	12,618	16,258
5. Subtotal		0	0	0	0	4,003	13,878	12,007	41,636	12,007	41,636	8,004	27,759	4,003	13,878	0	0	40,024	138,787	178,811
6. Price Contingencies		0	0	0	0	2,754	7,666	7,841	27,188	8,921	30,956	6,663	23,040	3,691	12,796	0	0	29,250	101,426	130,676
7. Total (iii)		0	0	0	0	6,157	21,344	19,848	68,824	20,928	72,572	14,647	50,799	7,694	26,674	0	0	69,274	240,213	309,487
(iv) Civil Works-Power Station																				
1. Civil Works		0	0	0	0	6,970	12,916	20,909	38,745	20,909	38,745	13,939	25,829	6,970	12,916	0	0	69,697	129,151	198,848
2. Duties and Taxes		0	0	0	0	542	1,627	1,627	1,627	1,627	1,065	542	542	542	542	0	0	5,423	0	5,423
3. Subtotal		0	0	0	0	7,512	12,916	22,536	38,745	22,536	38,745	15,024	25,829	7,512	12,916	0	0	75,120	129,151	204,271
4. Physical Contingencies		0	0	0	0	1,127	1,937	3,380	5,612	3,380	5,612	2,254	3,874	1,127	1,937	0	0	11,268	19,372	30,640
5. Subtotal		0	0	0	0	8,639	14,853	25,916	44,557	25,916	44,557	17,278	29,703	8,639	14,853	0	0	86,388	148,523	234,911
6. Price Contingencies		0	0	0	0	4,648	7,991	16,923	29,096	19,256	33,106	14,341	24,653	7,965	13,694	0	0	63,133	108,540	171,673
7. Total (iv)		0	0	0	0	13,287	22,844	42,839	73,653	45,172	77,663	31,619	54,356	16,604	28,547	0	0	149,521	257,063	406,584

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KUREIMAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY00		TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
(v) Civil Works-Colony																			
1. Civil Works	0	0	5,402	419	10,804	838	16,206	1,257	16,206	1,257	5,402	419	0	0	0	0	54,020	4,190	58,210
2. Duties and Taxes	0	0	18		35		53		53		18		0	0	0	0	177	0	177
3. Subtotal	0	0	5,420	419	10,839	838	16,259	1,257	16,259	1,257	5,420	419	0	0	0	0	54,197	4,190	58,387
4. Physical Contingencies	0	0	813	63	1,626	126	2,439	189	2,439	189	813	63	0	0	0	0	8,130	630	8,760
5. Subtotal	0	0	6,233	482	12,465	964	18,698	1,446	18,698	1,446	6,233	482	0	0	0	0	62,327	4,820	67,147
6. Price Contingencies	0	0	2,344	181	6,706	519	12,210	944	13,893	1,074	5,173	400	0	0	0	0	40,326	3,118	43,444
7. Total (v)	0	0	8,577	663	19,171	1,483	30,908	2,390	32,591	2,520	11,406	882	0	0	0	0	102,653	7,938	110,591
8. Total A	1,808	0	9,714	2,892	43,704	55,634	99,065	155,575	100,131	155,579	57,672	106,037	24,298	55,221	0	0	336,392	530,938	867,330
B. Steam Generators																			
1. Supply and Erection	0	0	3,927	20,998	7,851	41,996	15,701	83,992	23,552	125,987	15,701	83,992	7,851	41,996	3,927	20,998	78,510	419,959	498,469
2. Duties and Taxes	0	0	945		1,890		3,780		5,669		3,780		1,890		945		18,899	0	18,899
3. Subtotal	0	0	4,872	20,998	9,741	41,996	19,481	83,992	29,221	125,987	19,481	83,992	9,741	41,996	4,872	20,998	97,409	419,959	517,368
4. Physical Contingencies	0	0	487	2,100	974	4,200	1,948	8,399	2,922	12,599	1,948	8,399	974	4,200	487	2,100	9,740	41,997	51,737
5. Subtotal	0	0	5,359	23,098	10,715	46,196	21,429	92,391	32,143	138,586	21,429	92,391	10,715	46,196	5,359	23,098	107,149	461,956	569,105
6. Price Contingencies	0	0	2,015	8,685	5,765	24,853	13,993	60,331	23,882	102,969	17,786	76,685	9,879	42,593	5,455	23,514	78,775	339,630	418,405
7. Total B	0	0	7,374	31,783	16,480	71,049	35,422	152,722	56,025	241,555	39,215	169,076	20,594	88,789	10,814	46,612	185,924	801,586	987,510
C. Turbine Generators																			
1. Supply and Erection	0	0	1,205	19,863	2,409	39,725	3,610	59,588	7,224	119,176	6,019	99,316	2,409	39,725	1,205	19,863	24,081	397,254	621,335
2. Duties and Taxes	0	0	1,073		2,145		3,218		6,436		5,363		2,145		1,073		21,453	0	21,453
3. Subtotal	0	0	2,278	19,863	4,554	39,725	6,828	59,588	13,660	119,176	11,382	99,316	4,554	39,725	2,278	19,863	45,534	397,254	442,788
4. Physical Contingencies	0	0	228	1,986	435	3,973	683	5,959	1,366	11,918	1,138	9,731	455	3,973	228	1,986	4,533	39,725	44,279
5. Subtotal	0	0	2,506	21,849	5,009	43,698	7,511	65,547	15,026	131,094	12,520	109,245	5,009	43,698	2,506	21,849	50,067	436,980	487,067
6. Price Contingencies	0	0	942	8,215	2,695	23,510	4,905	44,802	11,164	97,403	10,392	90,673	4,618	40,290	2,551	22,242	37,267	325,135	362,402
7. Total C	0	0	3,448	30,064	7,704	67,208	12,416	108,349	26,190	228,497	22,912	199,918	9,627	83,988	5,057	44,091	87,334	762,115	849,469
D. Water and Waste Treatment																			
1. Supply and Erection	0	0	0	2,927	0	5,861	0	17,579	0	17,579	0	11,718	0	2,930	0	0	0	58,596	58,596
2. Duties and Taxes	0	0	167		334		1,002		1,002		668		167		0		3,340	0	3,340
3. Subtotal	0	0	167	2,927	334	5,861	1,002	17,579	1,002	17,579	668	11,718	167	2,930	0	0	3,340	58,596	61,936
4. Physical Contingencies	0	0	17	293	33	586	100	1,758	100	1,758	67	1,172	17	293	0	0	334	5,860	6,194
5. Subtotal	0	0	184	3,220	367	6,447	1,102	19,337	1,102	19,337	735	12,890	184	3,223	0	0	3,674	64,456	68,130
6. Price Contingencies	0	0	69	1,211	197	3,468	720	12,627	819	14,367	610	10,699	170	2,972	0	0	2,585	45,344	47,929
7. Total D	0	0	253	4,431	564	9,915	1,822	31,964	1,921	33,704	1,345	23,589	354	6,195	0	0	6,259	109,798	116,057

EGYPT

KUREHMAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL	TOTAL

E. Mechanical Equipment and Piping																				
(i) Feedwater Heaters and Condensers																				
1. Supply and Erection	0	0	0	6,145	0	12,286	0	18,431	0	18,431	0	6,145	0	0	0	0	0	0	61,438	61,438
2. Duties and Taxes	0	0	369	615	737	1,229	1,106	1,843	1,106	1,843	369	615	0	0	0	0	0	3,687	0	3,687
3. Subtotal	0	0	369	6,145	737	12,286	1,106	18,431	1,106	18,431	369	6,145	0	0	0	0	0	3,687	61,438	65,125
4. Physical Contingencies	0	0	0	615	0	1,229	111	1,843	111	1,843	0	615	0	0	0	0	0	370	6,145	6,515
5. Subtotal	0	0	406	6,760	811	13,515	1,217	20,274	1,217	20,274	406	6,760	0	0	0	0	0	4,057	67,583	71,640
6. Price Contingencies	0	0	153	2,542	436	7,271	795	13,239	904	15,064	337	5,611	0	0	0	0	0	2,625	43,727	46,352
7. Total (i)	0	0	559	9,302	1,247	20,786	2,012	33,513	2,121	35,338	743	12,371	0	0	0	0	0	6,682	111,310	117,992
(ii) Pumps and Drives																				
1. Supply and Erection	0	0	0	6,557	0	13,114	0	19,671	0	19,671	0	6,557	0	0	0	0	0	0	65,570	65,570
2. Duties and Taxes	0	0	393	615	787	1,229	1,180	1,843	1,180	1,843	393	615	0	0	0	0	0	3,933	0	3,933
3. Subtotal	0	0	393	6,557	787	13,114	1,180	19,671	1,180	19,671	393	6,557	0	0	0	0	0	3,933	65,570	69,503
4. Physical Contingencies	0	0	39	656	79	1,311	118	1,967	118	1,967	39	656	0	0	0	0	0	393	6,557	6,950
5. Subtotal	0	0	432	7,213	866	14,425	1,298	21,638	1,298	21,638	432	7,213	0	0	0	0	0	4,326	72,127	76,453
6. Price Contingencies	0	0	162	2,712	466	7,761	848	14,130	964	16,077	359	5,987	0	0	0	0	0	2,799	46,667	49,466
7. Total (ii)	0	0	594	9,925	1,332	22,186	2,146	35,768	2,262	37,715	791	13,200	0	0	0	0	0	7,125	118,794	125,919
(iii) Piping, Valves & Misc. Equipment																				
1. Supply	0	0	693	8,514	1,386	17,025	2,082	25,539	2,082	25,539	693	8,514	0	0	0	0	0	6,936	85,131	92,067
2. Duties and Taxes	0	0	511	851	1,022	1,703	1,532	2,554	1,532	2,554	511	851	0	0	0	0	0	5,108	0	5,108
3. Subtotal	0	0	1,204	8,514	2,408	17,025	3,614	25,539	3,614	25,539	1,204	8,514	0	0	0	0	0	12,044	85,131	97,175
4. Physical Contingencies	0	0	120	851	241	1,703	361	2,554	361	2,554	120	851	0	0	0	0	0	1,203	8,513	9,716
5. Subtotal	0	0	1,324	9,365	2,649	18,728	3,975	28,093	3,975	28,093	1,324	9,365	0	0	0	0	0	13,247	93,644	106,891
6. Price Contingencies	0	0	498	3,521	1,425	10,076	2,596	18,345	2,953	20,073	1,099	7,773	0	0	0	0	0	8,571	60,588	69,159
7. Total (iii)	0	0	1,822	12,886	4,074	28,804	6,571	46,438	6,928	48,966	2,423	17,138	0	0	0	0	0	21,818	154,232	176,050
(iv) Mechanical/Piping Erection																				
1. Installation	0	0	1,472	6,818	3,683	17,041	8,102	37,491	11,048	51,127	5,155	23,859	5,155	23,859	2,208	10,227	36,423	170,422	207,245	
2. Duties and Taxes	0	0	123	682	307	1,704	675	3,749	920	5,115	429	2,386	429	2,386	184	839	3,067	0	3,067	
3. Subtotal	0	0	1,595	6,818	3,990	17,041	8,777	37,491	11,968	51,127	5,584	25,859	5,584	25,859	2,392	10,227	39,490	170,422	210,312	
4. Physical Contingencies	0	0	160	682	399	1,704	878	3,749	1,197	5,115	558	2,386	558	2,386	239	1,023	3,989	17,043	21,032	
5. Subtotal	0	0	1,755	7,500	4,389	18,745	9,655	41,240	13,165	56,242	6,142	28,245	6,142	28,245	2,631	11,250	43,479	187,465	231,344	
6. Price Contingencies	0	0	660	2,820	2,361	10,085	6,305	26,930	9,782	41,726	5,098	21,783	5,663	24,198	2,678	11,453	32,547	139,055	171,602	
7. Total (iv)	0	0	2,415	10,320	6,750	28,830	15,960	68,170	22,947	98,026	11,240	48,028	11,805	50,443	5,309	22,703	76,426	326,520	402,946	

EGYPT

KUREIMAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99		TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
(v) Yard Tanks																					
1. Supply and Installation	0	0	1,594	1,861	3,185	3,722	4,778	5,584	4,778	5,584	1,594	1,861	0	0	0	0	15,929	18,612	34,541		
2. Duties and Taxes	0	0	95		190		285		285		95		0		0		950	0	950		
3. Subtotal	0	0	1,689	1,861	3,375	3,722	5,063	5,584	5,063	5,584	1,689	1,861	0	0	0	0	16,879	18,612	35,491		
4. Physical Contingencies	0	0	169	186	338	372	506	558	506	558	169	186	0	0	0	0	1,688	1,860	3,548		
5. Subtotal	0	0	1,858	2,047	3,713	4,094	5,569	6,142	5,569	6,142	1,858	2,047	0	0	0	0	18,567	20,472	39,039		
6. Price Contingencies	0	0	699	770	1,598	2,203	3,637	4,011	4,138	4,564	1,542	1,699	0	0	0	0	12,014	13,247	25,261		
7. Total (v)	0	0	2,557	2,817	5,311	6,297	9,206	10,153	9,707	10,706	3,400	3,746	0	0	0	0	30,581	33,719	64,300		
8. Total E	0	0	7,947	45,250	19,114	106,903	35,895	194,042	43,965	230,751	18,597	94,483	11,805	50,443	5,309	22,703	142,632	744,575	887,207		
F. Instrumentation and Controls																					
1. Supply and Installation	0	0	0	8,514	0	17,025	0	25,539	0	25,539	0	8,514	0	0	0	0	0	0	85,131		85,131
2. Duties and Taxes	0	0	511		1,022		1,532		1,532		511		0		0		5,108	0	5,108		5,108
3. Subtotal	0	0	511	8,514	1,022	17,025	1,532	25,539	1,532	25,539	511	8,514	0	0	0	0	5,108	85,131	90,239		90,239
4. Physical Contingencies	0	0	51	851	102	1,703	153	2,554	153	2,554	51	851	0	0	0	0	510	8,513	9,023		9,023
5. Subtotal	0	0	562	9,365	1,124	18,728	1,685	28,093	1,685	28,093	562	9,365	0	0	0	0	5,618	93,644	99,262		99,262
6. Price Contingencies	0	0	211	3,521	605	10,076	1,100	18,345	1,252	20,873	466	7,773	0	0	0	0	3,634	60,508	64,222		64,222
7. Total F	0	0	773	12,886	1,729	28,804	2,785	46,438	2,937	48,966	1,028	17,138	0	0	0	0	9,252	154,232	163,484		163,484
G. Electrical Equipment and Cables																					
(i) Switchyard																					
1. Supply and Installation	3,650	16,292	7,296	32,581	10,944	48,873	10,944	48,873	3,650	16,292	0	0	0	0	0	0	36,488	162,911	199,399		199,399
2. Duties and Taxes	831		1,662		2,493		2,493		831		0		0		0		8,310	0	8,310		8,310
3. Subtotal	4,481	16,292	8,958	32,581	13,437	48,873	13,437	48,873	4,481	16,292	0	0	0	0	0	0	44,798	162,911	207,709		207,709
4. Physical Contingencies	448	1,629	896	3,258	1,344	4,887	1,344	4,887	448	1,629	0	0	0	0	0	0	4,480	16,290	20,770		20,770
5. Subtotal	4,929	17,921	9,854	35,839	14,783	53,760	14,783	53,760	4,929	17,921	0	0	0	0	0	0	49,278	179,201	228,479		228,479
6. Price Contingencies	690	2,509	3,705	13,475	7,953	28,923	9,653	35,105	3,642	13,315	0	0	0	0	0	0	25,463	93,327	118,990		118,990
7. Total (i)	5,619	20,430	13,559	49,314	22,736	82,683	24,436	88,865	8,591	31,236	0	0	0	0	0	0	74,941	272,528	347,469		347,469
(ii) Auxiliary Equipment																					
1. Supply	0	0	561	12,768	1,079	25,539	1,420	38,306	1,420	38,306	541	12,768	0	0	0	0	5,401	127,687	133,088		133,088
2. Duties and Taxes	0	0	766		1,532		2,298		2,298		766		0		0		7,660	0	7,660		7,660
3. Subtotal	0	0	1,307	12,768	2,611	25,539	3,918	38,306	3,918	38,306	1,307	12,768	0	0	0	0	13,061	127,687	140,748		140,748
4. Physical Contingencies	0	0	131	1,277	261	2,594	392	3,831	392	3,831	131	1,277	0	0	0	0	1,307	12,770	14,077		14,077
5. Subtotal	0	0	1,438	14,045	2,872	28,093	4,310	42,137	4,310	42,137	1,438	14,045	0	0	0	0	14,368	140,457	154,825		154,825
6. Price Contingencies	0	0	561	5,281	1,545	15,114	2,814	27,515	3,202	31,308	1,194	11,657	0	0	0	0	9,296	90,875	100,171		100,171
7. Total (ii)	0	0	1,999	19,326	4,417	43,207	7,124	69,652	7,512	73,443	2,632	25,702	0	0	0	0	23,664	231,332	254,996		254,996

EGYPT

KUREHMAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99		TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
(iii) Electrical/Instruments Erection																					
1. Supply and Installation	0	0	1,911	7,095	3,821	14,187	7,643	28,377	11,468	42,563	9,554	35,468	1,914	14,187	0	0	36,311	141,877	178,188		
2. Duties and Taxes	0	0	170		360		681		1,022		851		360		0	0	3,404	0	3,404		
3. Subtotal	0	0	2,081	7,095	4,181	14,187	8,324	28,377	12,490	42,563	10,405	35,468	2,254	14,187	0	0	39,715	141,877	181,592		
4. Physical Contingencies	0	0	208	710	416	1,419	832	2,838	1,249	4,256	1,041	3,547	225	1,419	0	0	3,971	14,189	18,160		
5. Subtotal	0	0	2,289	7,805	4,577	15,606	9,156	31,215	13,739	46,819	11,446	39,015	2,479	15,606	0	0	43,686	156,066	199,752		
6. Price Contingencies	0	0	861	2,935	2,462	8,396	5,979	20,383	10,208	34,787	9,500	32,382	2,285	14,389	0	0	31,296	113,272	144,568		
7. Total (iii)	0	0	3,150	10,740	7,039	24,002	15,135	51,598	23,947	81,606	20,946	71,397	4,765	29,995	0	0	74,982	269,338	344,320		
8. Total G	5,619	20,430	18,688	79,380	34,192	149,892	46,695	210,115	40,050	186,287	23,578	97,099	4,765	29,995	0	0	173,587	775,198	946,785		
II. Training Simulator																					
1. Supply, Installation & Training	0	0	0	0	294	1,000	1,178	4,000	1,178	4,000	294	1,000	0	0	0	0	2,944	10,000	12,944		
2. Duties and Taxes	0	0	0	0	54		216		216		54		0	0	0	0	540	0	540		
3. Subtotal	0	0	0	0	348	1,000	1,394	4,000	1,394	4,000	348	1,000	0	0	0	0	3,484	10,000	13,484		
4. Physical Contingencies	0	0	0	0	35	100	139	400	139	400	35	100	0	0	0	0	348	1,000	1,348		
5. Subtotal	0	0	0	0	383	1,100	1,533	4,400	1,533	4,400	383	1,100	0	0	0	0	3,832	11,000	14,832		
6. Price Contingencies	0	0	0	0	206	592	1,001	2,873	1,139	3,269	318	913	0	0	0	0	2,664	7,647	10,311		
7. Total H	0	0	0	0	589	1,692	2,534	7,273	2,672	7,669	701	2,013	0	0	0	0	6,496	18,647	25,143		
I. Environmental Monitoring Equipment																					
1. Supply, Installation & Training	0	0	0	1,016	0	4,059	0	1,353	0	340	0	0	0	0	0	0	0	6,768	6,768		
2. Duties and Taxes	0	0	55	219	219	73	18		18		0		0		0	0	365	0	365		
3. Subtotal	0	0	55	1,016	219	4,059	73	1,353	18	340	0	0	0	0	0	0	365	6,768	7,133		
4. Physical Contingencies	0	0	6	102	22	406	7	135	2	34	0	0	0	0	0	0	37	677	714		
5. Subtotal	0	0	61	1,118	241	4,465	80	1,488	20	374	0	0	0	0	0	0	402	7,445	7,847		
6. Price Contingencies	0	0	23	420	130	2,402	52	972	15	278	0	0	0	0	0	0	220	4,072	4,292		
7. Total I	0	0	84	1,538	371	6,867	132	2,460	35	652	0	0	0	0	0	0	622	11,517	12,139		
J. Wrap-up Construction Insurance																					
1. Wrap-up Insurance	0	0	0	1,366	0	2,693	0	8,078	0	5,386	0	2,693	0	1,366	0	0	0	21,542	21,542		
2. Price Contingencies	0	0	0	506	0	1,469	0	5,275	0	4,002	0	2,235	0	1,261	0	0	0	14,708	14,708		
3. Total J	0	0	0	1,872	0	4,162	0	13,353	0	9,388	0	4,928	0	2,587	0	0	0	36,250	36,250		
4. Total I - Kurehmatt Power Station	7,427	20,430	48,281	210,076	124,447	502,106	236,766	922,291	273,926	1,143,048	165,048	714,281	71,443	317,218	21,180	113,406	948,518	3,942,856	4,891,374		

EGYPT

KUREHMAT PUMP PROJECT

PROJECT COST TABLES

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92	FY99	TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN			
II. Gas Interconnection (Pipeline)																			
A. Pipeline Material, Fitting and Tools																			
1. Supply	0	0	0	0	1,907	8,296	3,808	17,213	5,712	25,839	5,712	25,839	1,907	8,423	0	0	19,046	85,810	104,856
2. Duties and Taxes	0	0	0	0	398		826		1,240		1,240		414		0	0	4,118	0	4,118
3. Subtotal	0	0	0	0	2,305	8,296	4,634	17,213	6,952	25,839	6,952	25,839	2,321	8,623	0	0	23,164	85,810	108,974
4. Physical Contingencies	0	0	0	0	231	830	463	1,721	695	2,584	695	2,584	232	862	0	0	2,316	8,581	10,897
5. Subtotal	0	0	0	0	2,536	9,126	5,097	18,934	7,647	28,423	7,647	28,423	2,553	9,485	0	0	25,480	94,391	119,871
6. Price Contingencies	0	0	0	0	1,364	4,910	3,328	12,364	5,682	21,118	6,347	23,591	2,354	8,765	0	0	19,075	70,728	89,803
7. Total A	0	0	0	0	3,900	14,036	8,425	31,298	13,329	49,541	13,994	52,014	4,907	18,230	0	0	44,555	165,719	209,674
B. Pressure reducing Station & Metering																			
1. Supply	0	0	0	0	261	244	521	505	789	762	789	762	261	254	0	0	2,621	2,527	5,148
2. Duties and Taxes	0	0	0	0	12		24		37		37		12		0	0	122	0	122
3. Subtotal	0	0	0	0	273	244	545	505	826	762	826	762	273	254	0	0	2,743	2,527	5,270
4. Physical Contingencies	0	0	0	0	27	24	55	51	85	76	85	76	27	25	0	0	275	252	527
5. Subtotal	0	0	0	0	300	268	600	556	909	838	909	838	300	279	0	0	3,018	2,779	5,797
6. Price Contingencies	0	0	0	0	161	144	372	363	675	623	754	696	277	257	0	0	2,259	2,085	4,344
7. Total B	0	0	0	0	461	412	972	919	1,584	1,461	1,663	1,534	577	536	0	0	5,277	4,862	10,139
C. Pipe Costing Material																			
1. Supply	0	0	0	0	0	1,478	0	3,036	0	4,557	0	4,557	0	1,518	0	0	0	15,146	15,146
2. Duties and Taxes	0	0	0	0	71		146		219		219		73		0	0	728	0	728
3. Subtotal	0	0	0	0	71	1,478	146	3,036	219	4,557	219	4,557	73	1,518	0	0	728	15,146	15,874
4. Physical Contingencies	0	0	0	0	7	148	15	304	22	456	22	456	7	152	0	0	73	1,516	1,589
5. Subtotal	0	0	0	0	78	1,626	161	3,340	241	5,013	241	5,013	80	1,670	0	0	801	16,662	17,463
6. Price Contingencies	0	0	0	0	42	875	105	2,181	179	3,725	200	4,161	74	1,540	0	0	600	12,482	13,082
7. Total C	0	0	0	0	120	2,501	266	5,521	420	8,738	441	9,174	154	3,210	0	0	1,401	29,144	30,545
8. Total II - Gas Interconnection	0	0	0	0	4481	16949	9683	37738	15335	59740	16098	62722	5638	21976	0	0	51,233	199,125	250,358
III. Transmission Lines																			
A. Substation Rehabilitation																			
1. Supply and Installation	0	0	2,214	11,411	4,435	22,820	6,656	34,238	6,656	34,238	2,214	11,411	0	0	0	0	22,175	114,118	136,293
2. Duties and Taxes	0	0	582		1,164		1,746		1,746		582		0		0	0	5,820	0	5,820
3. Subtotal	0	0	2,796	11,411	5,599	22,820	8,402	34,238	8,402	34,238	2,796	11,411	0	0	0	0	27,995	114,118	142,113
4. Physical Contingencies	0	0	280	1,141	560	2,282	840	3,424	840	3,424	280	1,141	0	0	0	0	2,800	11,412	14,212
5. Subtotal	0	0	3,076	12,552	6,159	25,102	9,242	37,662	9,242	37,662	3,076	12,552	0	0	0	0	30,795	125,530	156,325
6. Price Contingencies	0	0	1,157	4,720	3,314	13,505	6,033	24,543	6,867	27,983	2,533	10,418	0	0	0	0	19,926	81,219	101,145
7. Total A	0	0	4,233	17,272	9,473	38,607	15,277	62,255	16,109	65,645	5,609	22,970	0	0	0	0	50,721	206,749	257,470

EGYPT

KUIREHMAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY00		TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
B. Station Interconnection to the Grid																			
1. Supply and Installation	0	0	3,254	6,732	6,504	13,444	9,758	20,196	9,758	20,196	3,254	6,732	0	0	0	0	32,528	67,320	99,848
2. Duties and Taxes	0	0	343		687		1,030		1,030		343						3,433	0	3,433
3. Subtotal	0	0	3,597	6,732	7,191	13,444	10,788	20,196	10,788	20,196	3,597	6,732	0	0	0	0	35,961	67,320	103,281
4. Physical Contingencies	0	0	360	673	719	1,366	1,079	2,020	1,079	2,020	360	673	0	0	0	0	3,597	6,732	10,329
5. Subtotal	0	0	3,957	7,405	7,910	14,810	11,867	22,216	11,867	22,216	3,957	7,405	0	0	0	0	39,558	74,052	113,610
6. Price Contingencies	0	0	1,488	2,784	4,256	7,968	7,749	14,507	8,817	16,506	3,284	6,144	0	0	0	0	25,594	47,911	73,505
7. Total B	0	0	5,445	10,189	12,166	22,778	19,616	36,723	20,684	38,722	7,241	13,551	0	0	0	0	65,152	121,963	187,115
C. Other Transmission Lines																			
1. Supply and Installation	0	0	1,386	1,356	3,462	3,396	7,423	7,465	10,392	10,181	4,828	4,752	4,828	4,752	1,619	2,036	33,938	33,938	67,876
2. Duties and Taxes	0	0	69		173		381		519		242		242		104		1,730	0	1,730
3. Subtotal	0	0	1,455	1,356	3,635	3,396	8,004	7,465	10,911	10,181	5,070	4,752	5,070	4,752	1,523	2,036	35,668	33,938	69,606
4. Physical Contingencies	0	0	146	156	364	340	800	747	1,091	1,018	507	475	507	475	152	204	3,567	3,395	6,962
5. Subtotal	0	0	1,601	1,512	3,999	3,736	8,804	8,212	12,002	11,199	5,577	5,227	5,577	5,227	1,675	2,240	39,235	37,333	76,568
6. Price Contingencies	0	0	602	561	2,151	2,010	5,749	5,362	8,917	8,321	4,629	4,338	5,142	4,819	1,705	2,280	28,895	27,691	56,586
7. Total C	0	0	2,203	2,073	6,150	5,746	14,553	13,574	20,919	19,520	10,206	9,565	10,719	10,046	3,380	4,520	68,130	65,024	133,154
D. Line Loss Reduction Equipment																			
1. Supply and Installation	0	0	85	792	208	1,980	455	4,356	620	5,937	290	2,769	290	2,769	122	1,188	2,068	19,791	21,859
2. Duties and Taxes	0	0	40		101		222		303		141		141		61		1,009	0	1,009
3. Subtotal	0	0	125	792	309	1,980	677	4,356	923	5,937	431	2,769	431	2,769	183	1,188	3,077	19,791	22,868
4. Physical Contingencies	0	0	12	79	31	198	68	436	92	594	43	277	43	277	18	119	307	1,980	2,287
5. Subtotal	0	0	137	871	340	2,178	745	4,792	1,015	6,531	474	3,046	474	3,046	201	1,307	3,384	21,771	25,155
6. Price Contingencies	0	0	51	527	183	1,172	486	3,129	754	4,853	393	2,528	437	2,808	205	1,331	2,509	16,148	18,657
7. Total D	0	0	186	1,398	523	3,350	1,231	7,921	1,769	11,384	867	5,574	911	5,854	406	2,638	5,893	37,919	43,812
8. Total III - Transmission Lines	0	0	12,067	30,712	28,312	70,481	50,677	120,473	59,481	135,271	23,943	51,660	11,630	15,900	3,786	7,158	189,886	431,655	621,551
IV. Technical Assistance																			
A. Engineering Consultancy Services																			
1. Consultancy Service	868	2,828	1,739	5,653	4,346	14,134	7,824	25,436	7,824	25,436	5,217	16,999	1,158	3,769	0	0	28,976	94,215	123,191
2. Price Contingencies	122	396	654	2,125	2,338	7,604	5,109	16,610	5,813	18,859	4,330	14,076	1,068	3,475	0	0	19,434	63,786	82,620
3. Total A	990	3,224	2,393	7,779	6,684	21,738	12,933	42,046	13,637	44,335	9,547	31,035	2,226	7,244	0	0	48,410	157,601	205,811
B. Training Consultancy Services																			
1. Consultancy Service	0	0	10	106	30	267	63	584	66	577	40	373	40	373	17	158	286	2,660	2,946
2. Price Contingencies	0	0	4	40	16	144	41	381	64	594	33	310	37	344	17	161	212	1,974	2,186
3. Total B	0	0	14	146	46	411	104	965	130	1,171	73	683	77	717	34	319	498	4,634	5,132

EGYPT

HAZELTUN POWER PROJECT

PROJECT COST TABLES

IN THOUSAND LE	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY00		TOTAL PROJECT COST		
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN			
C. Training Equipment	1. Supply and Installation	0	0	46	439	119	119	1,099	261	2,416	356	168	165	1,538	165	78	1,538	165	78	12,166	
	2. Duties and Taxes	0	0	22	56	56	56	56	123	168	168	78	78	78	78	78	78	78	78	559	
3. Subtotal Contingencies		0	0	68	439	175	175	1,099	384	2,416	524	243	243	1,538	243	78	1,538	243	78	12,727	
	4. Physical Contingencies	0	0	7	44	44	44	110	38	242	52	24	24	154	24	77	154	24	77	1,275	
5. Subtotal		0	0	75	485	193	193	1,209	422	2,658	576	287	287	1,692	287	118	1,692	287	118	14,403	
	6. Price Contingencies	0	0	28	104	104	104	450	276	1,736	428	222	222	1,404	266	1,550	266	1,404	266	10,388	
7. Total C		0	0	103	655	297	297	1,859	698	4,394	1,004	489	489	3,096	513	238	3,096	513	238	26,306	
	D. Project & Financial Management System																				
1. Consultancy Services		0	0	23	211	211	211	531	116	1,175	168	83	83	802	83	30	802	83	30	5,948	
	2. Price Contingencies	0	0	9	79	79	79	286	76	767	125	69	69	666	69	31	666	69	31	4,616	
3. Total D		0	0	32	290	290	290	817	192	1,942	293	152	152	1,468	152	61	1,468	152	61	10,566	
	E. System Hardware and Software																				
1. Supply and Installation		0	0	10	139	139	139	347	79	779	109	56	56	521	56	13	521	56	13	3,858	
	2. Duties and Taxes	0	0	7	18	18	18	60	40	53	27	27	27	27	27	27	27	27	27	145	
3. Subtotal		0	0	17	139	139	139	347	79	779	146	83	83	521	83	40	521	83	40	4,003	
	4. Physical Contingencies	0	0	2	14	14	14	35	12	78	16	8	8	52	8	1	52	8	1	400	
5. Subtotal Contingencies		0	0	19	153	153	153	382	131	857	178	91	91	573	91	14	573	91	14	4,403	
	6. Price Contingencies	0	0	7	38	38	38	206	86	549	152	76	76	476	76	16	476	76	16	3,251	
7. Total E		0	0	26	211	211	211	588	217	1,417	310	167	167	1,049	167	28	1,049	167	28	7,654	
	F. Load Management Equipment																				
1. Supply and Installation		0	0	92	92	92	228	0	0	505	0	0	350	0	0	350	0	0	1,667		
	2. Duties and Taxes	0	0	5	5	5	28	28	28	28	18	18	18	18	18	18	18	18	18	86	
3. Subtotal Contingencies		0	0	97	97	97	228	28	28	505	28	28	350	28	28	350	28	28	1,667		
	4. Physical Contingencies	0	0	1	9	9	23	51	2	48	2	2	35	2	2	35	2	2	179		
5. Subtotal		0	0	101	101	101	251	29	29	505	29	29	385	29	29	385	29	29	1,753		
	6. Price Contingencies	0	0	2	38	38	135	19	19	368	19	19	320	19	19	320	19	19	1,330		
7. Total F		0	0	8	139	139	386	48	48	919	44	44	705	44	44	705	44	44	3,299		
	B. Total IV - Technical Assistance																				
8. Total IV - Technical Assistance		990	3,226	2,576	9,230	7,224	25,799	14,192	51,683	36,178	1,395,770	215,554	866,699	91,810	369,018	369,018	25,327	125,218	1,243,992	4,775,897	6,019,889
	9. Total	990	3,226	2,576	9,230	7,224	25,799	14,192	51,683	36,178	1,395,770	215,554	866,699	91,810	369,018	369,018	25,327	125,218	1,243,992	4,775,897	6,019,889

EGYPT
DAMHAH POWER PROJECT
PROJECT COST TABLES

IN THOUSAND LE

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN
A. Reserve Procurement																
1. Installation of Gas Pipeline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Duties and Taxes	0	0	749	0	1,502	0	2,251	0	4,501	0	4,501	0	1,502	0	15,006	0
3. Subtotal Contributions	0	0	749	0	1,502	0	2,251	0	4,501	0	4,501	0	1,502	0	15,006	0
4. Physical Contributions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Subtotal	0	0	749	0	1,502	0	2,251	0	4,501	0	4,501	0	1,502	0	15,006	0
6. Price Contingencies	0	0	310	0	1,652	0	2,476	0	4,951	0	4,951	0	1,652	0	16,506	0
2. Total A	0	0	1,134	0	2,541	0	4,093	0	8,630	0	9,066	0	3,175	0	28,633	0
VI. Interest During Construction																
1. Bank Financed	658	4,679	25,069	39,997	10,801	25,052	76,778	135,039	46,644	65,320	191,724	152,797	152,797	0	471,186	471,186
2. Others	0	5,337	0	27,391	0	50,698	0	101,830	0	131,685	0	257,044	0	0	625,983	625,983
TOTAL VI - Interest During Constr.	8,417	28,991	64,058	277,409	167,005	666,003	315,611	1,236,012	572,808	1,577,653	224,616	1,125,743	96,985	369,018	5,399,800	6,672,505
TOTAL FINANCING REQUIRED (I+VI)	8,417	28,991	64,058	277,409	167,005	666,003	315,611	1,236,012	572,808	1,577,653	224,616	1,125,743	96,985	369,018	5,399,800	6,672,505

EGYPT		LIBYAN POWER PROJECT		PROJECT COST TABLES		IN THOUSAND US\$	
FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN
400	400	400	70	405	70	0	405
3. Subtotal	470	470	0	470	0	0	470
4. Physical Contingencies	11	0	0	0	0	0	11
5. Subtotal	481	470	0	470	0	0	481
6. Price Contingencies	10	0	0	0	0	0	10
7. Total (i)	491	470	0	470	0	0	491
1. Supply and Erection	0	197	427	197	427	0	1,976
2. Duties and Taxes	0	20	0	20	0	0	4,268
3. Subtotal	0	217	427	217	427	0	6,466
4. Physical Contingencies	0	35	66	35	66	0	968
5. Subtotal	0	250	491	250	491	0	7,616
6. Price Contingencies	0	15	29	15	29	0	306
7. Total (ii)	0	265	520	265	520	0	8,320
1. Supply and Erection	0	1,104	2,161	1,166	2,244	0	11,976
2. Duties and Taxes	0	186	551	186	551	0	3,625
3. Subtotal	0	1,290	2,717	1,352	2,795	0	15,601
4. Physical Contingencies	0	110	382	110	382	0	2,278
5. Subtotal	0	1,400	3,109	1,462	3,177	0	17,879
6. Price Contingencies	0	123	425	123	425	0	2,697
7. Total (iii)	0	1,523	3,534	1,585	3,602	0	20,576
1. Civil Works	0	0	0	0	0	0	21,120
2. Duties and Taxes	0	166	495	166	495	0	1,645
3. Subtotal	0	166	495	166	495	0	2,185
4. Physical Contingencies	0	0	0	0	0	0	3,613
5. Subtotal	0	166	495	166	495	0	5,800
6. Price Contingencies	0	0	0	0	0	0	2,997
7. Total (iv)	0	166	495	166	495	0	8,797
1. Supply and Erection	0	0	0	0	0	0	12,130
2. Duties and Taxes	0	0	0	0	0	0	2,238
3. Subtotal	0	0	0	0	0	0	14,368
4. Physical Contingencies	0	0	0	0	0	0	5,395
5. Subtotal	0	0	0	0	0	0	19,763
6. Price Contingencies	0	0	0	0	0	0	4,915
7. Total (v)	0	0	0	0	0	0	24,678
1. Supply and Erection	0	0	0	0	0	0	21,120
2. Duties and Taxes	0	0	0	0	0	0	39,137
3. Subtotal	0	0	0	0	0	0	60,257
4. Physical Contingencies	0	0	0	0	0	0	9,157
5. Subtotal	0	0	0	0	0	0	69,414
6. Price Contingencies	0	0	0	0	0	0	1,645
7. Total (vi)	0	0	0	0	0	0	78,576
1. Supply and Erection	0	0	0	0	0	0	22,782
2. Duties and Taxes	0	0	0	0	0	0	39,137
3. Subtotal	0	0	0	0	0	0	61,919
4. Physical Contingencies	0	0	0	0	0	0	5,000
5. Subtotal	0	0	0	0	0	0	66,919
6. Price Contingencies	0	0	0	0	0	0	2,997
7. Total (vii)	0	0	0	0	0	0	74,913
1. Supply and Erection	0	0	0	0	0	0	26,176
2. Duties and Taxes	0	0	0	0	0	0	46,829
3. Subtotal	0	0	0	0	0	0	73,005
4. Physical Contingencies	0	0	0	0	0	0	8,304
5. Subtotal	0	0	0	0	0	0	81,309
6. Price Contingencies	0	0	0	0	0	0	13,135
7. Total (viii)	0	0	0	0	0	0	94,444

I. Renewable Power Station
 A. Land, Civil Works and Colony
 (i) Land and Architectural Services
 1. Land Power Station & Colony
 2. Architectural Services

EGYPT

ELREINAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND US\$

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92	FY99	TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN			
(v) Yard Tanks																			
1. Supply and Installation	0	0	483	564	965	1,128	1,448	1,692	1,448	1,692	483	564					4,827	5,640	10,467
2. Duties and Taxes	0		29		58		86		86		29						288	0	288
3. Subtotal	0	0	512	564	1,023	1,128	1,534	1,692	1,534	1,692	512	564	0	0	0	0	5,115	5,640	10,755
4. Physical Contingencies	0	0	51	56	102	113	153	169	153	169	51	56	0	0	0	0	510	563	1,073
5. Subtotal	0	0	563	620	1,125	1,241	1,687	1,861	1,687	1,861	563	620	0	0	0	0	5,625	6,203	11,828
6. Price Contingencies	0	0	33	37	116	125	241	266	317	350	132	145	0	0	0	0	837	923	1,760
7. Total (v)	0	0	596	657	1,239	1,366	1,928	2,127	2,004	2,211	695	765	0	0	0	0	6,462	7,126	13,588
8. Total E	0	0	1,853	10,553	4,145	23,189	7,520	40,659	9,082	47,659	3,801	19,306	2,388	10,204	1,064	4,544	29,853	156,114	185,967
F. Instrumentation and Controls																			
1. Supply	0	0	0	2,580	0	5,159	0	7,739	0	7,739	0	2,580					0	25,797	25,797
2. Duties and Taxes	0		155		310		464		464		155						1,548	0	1,548
3. Subtotal	0	0	155	2,580	310	5,159	464	7,739	464	7,739	155	2,580	0	0	0	0	1,548	25,797	27,345
4. Physical Contingencies	0	0	16	258	31	516	46	774	46	774	16	258	0	0	0	0	155	2,580	2,735
5. Subtotal	0	0	171	2,838	341	5,675	510	8,513	510	8,513	171	2,838	0	0	0	0	1,703	28,377	30,080
6. Price Contingencies	0	0	10	167	34	573	73	1,217	96	1,600	40	664	0	0	0	0	253	4,221	4,474
7. Total F	0	0	181	3,005	375	6,248	583	9,730	606	10,113	211	3,502	0	0	0	0	1,956	32,598	34,554
G. Electrical Equipment and Cables **																			
(i) Switchyard																			
1. Supply and Installation	1,106	4,937	2,211	9,873	3,317	14,810	3,317	14,810	1,106	4,937							11,057	49,367	60,424
2. Duties and Taxes	252		504		755		755		252								2,518	0	2,518
3. Subtotal	1,358	4,937	2,715	9,873	4,072	14,810	4,072	14,810	1,358	4,937	0	0	0	0	0	0	13,575	49,367	62,942
4. Physical Contingencies	136	494	272	987	407	1,481	407	1,481	136	494	0	0	0	0	0	0	1,358	4,937	6,295
5. Subtotal	1,494	5,431	2,987	10,860	4,479	16,291	4,479	16,291	1,494	5,431	0	0	0	0	0	0	14,933	54,304	69,237
6. Price Contingencies	30	109	176	641	452	1,645	640	2,330	281	1,021	0	0	0	0	0	0	1,579	5,746	7,325
7. Total (i)	1,524	5,540	3,163	11,501	4,931	17,936	5,119	18,621	1,775	6,452	0	0	0	0	0	0	16,512	60,050	76,562
(ii) Auxiliary Equipment																			
1. Supply	0	0	164	3,869	327	7,739	491	11,608	491	11,608	164	3,869					1,637	38,695	40,330
2. Duties and Taxes	0		232		464		696		696		232						2,320	0	2,320
3. Subtotal	0	0	396	3,869	791	7,739	1,187	11,608	1,187	11,608	396	3,869	0	0	0	0	3,957	38,695	42,650
4. Physical Contingencies	0	0	40	387	79	774	119	1,161	119	1,161	40	387	0	0	0	0	397	3,870	4,267
5. Subtotal	0	0	436	4,256	870	8,513	1,306	12,769	1,306	12,769	436	4,256	0	0	0	0	4,354	42,565	46,917
6. Price Contingencies	0	0	25	251	83	850	137	1,826	246	2,401	102	996	0	0	0	0	649	6,334	6,983
7. Total (ii)	0	0	462	4,507	958	9,373	1,493	14,595	1,552	15,170	538	5,252	0	0	0	0	5,003	48,897	53,900

EGYPT

KUREIMAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND US\$

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL	
(iii) Electrical/Instruments Erection																				
1. Supply and Installation	0	0	579	2,150	1,158	4,299	2,316	8,599	3,475	12,898	2,895	10,748	580	4,299				11,033	42,993	53,996
2. Duties and Taxes	0		52		103		206		310		258		103					1,192	0	1,032
3. Subtotal	0	0	631	2,150	1,261	4,299	2,522	8,599	3,785	12,898	3,153	10,748	683	4,299	0	0		12,035	42,993	55,028
4. Physical Contingencies	0	0	63	215	126	430	252	860	379	1,290	315	1,075	68	430	0	0		1,203	4,300	5,503
5. Subtotal	0	0	694	2,365	1,387	4,729	2,774	9,459	4,164	14,188	3,468	11,823	751	4,729	0	0		13,238	47,293	60,531
6. Price Contingencies	0	0	41	140	140	478	397	1,353	783	2,667	812	2,767	213	1,338	0	0		2,386	8,743	11,129
7. Total (iii)	0	0	735	2,505	1,527	5,207	3,171	10,812	4,947	16,855	4,280	14,590	964	6,067	0	0		15,624	56,036	71,660
8. Total G	1,524	5,540	4,360	18,513	7,416	32,516	9,783	44,028	8,274	38,477	4,818	19,042	964	6,067	0	0		37,139	164,983	202,122
M. Training Simulator																				
1. Supply, Installation & Training	0	0	0	0	89	303	357	1,212	357	1,212	89	303						892	3,030	3,922
2. Duties and Taxes	0		0		16		65		65		16							162	0	162
3. Subtotal	0	0	0	0	105	303	422	1,212	422	1,212	105	303	0	0	0	0		1,054	3,030	4,084
4. Physical Contingencies	0	0	0	0	11	30	42	121	42	121	11	30	0	0	0	0		106	302	408
5. Subtotal	0	0	0	0	116	333	464	1,333	464	1,333	116	333	0	0	0	0		1,160	3,332	4,492
6. Price Contingencies	0	0	0	0	12	34	66	191	87	251	27	78	0	0	0	0		192	554	746
7. Total H	0	0	0	0	128	367	530	1,524	551	1,584	143	411	0	0	0	0		1,352	3,886	5,238
I. Environmental Monitoring Equipment **																				
1. Supply, Installation & Training	0	0	0	308	0	1,230	0	410	0	103								0	2,051	2,051
2. Duties and Taxes	0		17		66		22		6									111	0	111
3. Subtotal	0	0	17	308	66	1,230	22	410	6	103	0	0	0	0	0	0		111	2,051	2,162
4. Physical Contingencies	0	0	2	31	7	123	2	41	1	10	0	0	0	0	0	0		12	205	217
5. Subtotal	0	0	19	339	73	1,353	24	451	7	113	0	0	0	0	0	0		123	2,256	2,379
6. Price Contingencies	0	0	1	20	7	157	3	64	1	21	0	0	0	0	0	0		12	262	254
7. Total I	0	0	20	359	80	1,490	27	515	8	134	0	0	0	0	0	0		135	2,498	2,633
J. Wrap-up Construction Insurance																				
1. Wrap-up Insurance	0	0	0	408	0	816	0	2,448	0	1,632	0	816	0	408				0	6,528	6,528
2. Price Contingencies	0	0	0	24	0	82	0	350	0	307	0	191	0	115	0	0		0	1,069	1,069
3. Total J	0	0	0	432	0	898	0	2,798	0	1,939	0	1,007	0	523	0	0		0	7,597	7,597
6. Total I - Kureimat Power Station	2,015	5,540	11,261	48,995	25,993	108,919	49,604	193,253	56,579	236,084	33,726	145,955	14,452	64,167	4,261	22,700		198,871	825,615	1,024,486

EGYPT

KUREINAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND US\$

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92	FY99	TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
II. Gas Interconnection (Pipeline) **																			
A. Pipeline Material, Fitting and Tools																			
1. Supply	0	0	0	0	578	2,514	1,154	5,216	1,731	7,830	1,731	7,830	578	2,613			5,772	26,003	31,775
2. Duties and Taxes	0		0		121		250		376		376		125				1,248	0	1,248
3. Subtotal	0	0	0	0	699	2,514	1,404	5,216	2,107	7,830	2,107	7,830	703	2,613	0	0	7,020	26,003	33,023
4. Physical Contingencies	0	0	0	0	70	251	140	522	211	783	211	783	70	261	0	0	702	2,600	3,302
5. Subtotal	0	0	0	0	769	2,765	1,544	5,738	2,318	8,613	2,318	8,613	773	2,874	0	0	7,722	28,603	36,325
6. Price Contingencies	0	0	0	0	78	279	221	821	436	1,619	542	2,015	219	813	0	0	1,496	5,547	7,043
7. Total A	0	0	0	0	847	3,044	1,765	6,559	2,754	10,232	2,860	10,628	992	3,687	0	0	9,218	34,150	43,368
B. Pressure reducing Station & Metering																			
1. Supply					79	74	158	153	239	231	239	231	79	77			794	766	1,560
2. Duties and Taxes	0		0		4		7		11		11		4				37	0	37
3. Subtotal	0	0	0	0	83	74	165	153	250	231	250	231	83	77	0	0	831	766	1,597
4. Physical Contingencies	0	0	0	0	8	7	17	15	25	23	25	23	8	8	0	0	83	76	159
5. Subtotal	0	0	0	0	91	81	182	168	275	254	275	254	91	85	0	0	914	842	1,756
6. Price Contingencies	0	0	0	0	9	8	25	24	52	48	59	54	26	24	0	0	177	163	340
7. Total B	0	0	0	0	100	89	208	192	327	302	339	313	117	109	0	0	1,091	1,005	2,096
C. Pipe Coating Material																			
1. Supply						448		920		1381		1381		460			0	4,590	4,590
2. Duties and Taxes	0		0		22		44		66		66		22				220	0	220
3. Subtotal	0	0	0	0	22	448	44	920	66	1,381	66	1,381	22	460	0	0	220	4,590	4,810
4. Physical Contingencies	0	0	0	0	2	45	4	92	7	138	7	138	2	46	0	0	22	459	481
5. Subtotal	0	0	0	0	24	493	48	1,012	73	1,519	73	1,519	24	506	0	0	242	5,049	5,291
6. Price Contingencies	0	0	0	0	2	50	7	145	14	286	17	355	7	143	0	0	47	979	1,026
7. Total C	0	0	0	0	26	543	55	1,157	87	1,805	90	1,874	31	649	0	0	289	6,028	6,317
8. Total II - Gas Interconnection	0	0	0	0	973	3676	2028	7908	3168	12339	3289	12815	1140	4445	0	0	10,598	41,183	51,781
III. Transmission Lines																			
A. Substation Rehabilitation																			
1. Supply and Installation	0	0	671	3,458	1,344	6,915	2,017	10,375	2,017	10,375	671	3,458	0	0	0	0	6,720	34,581	41,301
2. Duties and Taxes	0		176		353		529		529		176		0		0	0	1,763	0	1,763
3. Subtotal	0	0	847	3,458	1,697	6,915	2,546	10,375	2,546	10,375	847	3,458	0	0	0	0	8,483	34,581	43,064
4. Physical Contingencies	0	0	85	346	170	692	255	1,038	255	1,038	85	346	0	0	0	0	850	3,460	4,310
5. Subtotal	0	0	932	3,804	1,867	7,607	2,801	11,413	2,801	11,413	932	3,804	0	0	0	0	9,333	38,041	47,374
6. Price Contingencies	0	0	55	224	189	768	401	1,632	527	2,146	218	890	0	0	0	0	1,390	5,660	7,050
7. Total A	0	0	987	4,028	2,056	8,375	3,202	13,045	3,328	13,559	1,150	4,694	0	0	0	0	10,723	43,701	54,424

EGYPT

KUREINAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND US\$

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99		
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL
B. Station Interconnection to the Grid																					
1. Supply and Installation	0	0	986	2,040	1,971	4,080	2,957	6,120	2,957	6,120	986	2,040						9,857	20,400	30,257	
2. Duties and Taxes	0	0	104		208		312		312		104							1,040	0	1,040	
3. Subtotal	0	0	1,090	2,040	2,179	4,080	3,269	6,120	3,269	6,120	1,090	2,040	0	0	0	0	10,897	20,400	31,297		
4. Physical Contingencies	0	0	109	204	218	408	327	612	327	612	109	204	0	0	0	0	1,090	2,040	3,130		
5. Subtotal	0	0	1,199	2,244	2,397	4,488	3,596	6,732	3,596	6,732	1,199	2,244	0	0	0	0	11,987	22,440	34,427		
6. Price Contingencies	0	0	71	132	242	453	514	963	678	1,266	281	525	0	0	0	0	1,784	3,359	5,123		
7. Total B	0	0	1,270	2,376	2,639	4,941	4,110	7,695	4,272	7,998	1,480	2,769	0	0	0	0	13,771	25,779	39,550		
C. Other Transmission Lines																					
1. Supply and Installation	0	0	420	411	1,049	1,029	2,310	2,262	3,149	3,085	1,463	1,440	1,463	1,440	430	617	10,284	10,284	20,568		
2. Duties and Taxes	0	0	21		52		115		157		73		73		31		522	0	522		
3. Subtotal	0	0	441	411	1,101	1,029	2,425	2,262	3,306	3,085	1,536	1,440	1,536	1,440	461	617	10,806	10,284	21,090		
4. Physical Contingencies	0	0	44	41	110	103	243	226	331	309	154	144	154	144	46	62	1,082	1,029	2,111		
5. Subtotal	0	0	485	452	1,211	1,132	2,668	2,488	3,637	3,394	1,690	1,584	1,690	1,584	507	679	11,888	11,313	23,201		
6. Price Contingencies	0	0	29	27	122	114	382	356	684	638	395	371	478	448	169	226	2,259	2,180	4,439		
7. Total C	0	0	514	479	1,333	1,246	3,050	2,844	4,321	4,032	2,085	1,955	2,168	2,032	676	905	14,147	13,493	27,640		
D. Line Loss Reduction Equipment																					
1. Supply and Installation	0	0	25	240	63	600	138	1,320	188	1,799	88	839	88	839	37	360	627	5,997	6,624		
2. Duties and Taxes	0	0	12		31		67		92		43		43		18		306	0	306		
3. Subtotal	0	0	37	240	94	600	205	1,320	280	1,799	131	839	131	839	55	360	933	5,997	6,930		
4. Physical Contingencies	0	0	4	24	9	60	21	132	28	180	13	84	13	84	6	36	94	600	694		
5. Subtotal	0	0	41	264	103	660	226	1,452	308	1,979	144	923	144	923	61	396	1,027	6,597	7,624		
6. Price Contingencies	0	0	2	16	10	67	32	208	58	372	34	216	41	261	20	132	197	1,272	1,469		
7. Total D	0	0	43	280	113	727	258	1,660	366	2,351	178	1,139	185	1,184	81	528	1,224	7,869	9,093		
8. Total III -Transmission Lines	0	0	2,814	7,163	6,141	15,289	10,420	25,244	12,287	27,940	4,893	10,557	2,353	3,216	757	1,433	39,865	90,842	130,707		
IV. Technical Assistance **																					
A. Engineering Consultancy Services **																					
1. Consultancy Service	263	857	527	1,713	1,317	4,283	2,371	7,708	2,371	7,708	1,581	5,139	351	1,142			8,781	28,550	37,331		
2. Price Contingencies	5	17	31	101	135	433	339	1,102	446	1,449	370	1,203	99	323	0	0	1,423	4,628	6,051		
3. Total A	268	874	558	1,814	1,450	4,716	2,710	8,810	2,817	9,157	1,951	6,342	450	1,465	0	0	10,204	33,178	43,382		
B. Training Consultancy Services **																					
1. Consultancy Service **	0	0	3	32	9	81	19	177	26	242	12	113	12	113	5	48	86	806	892		
2. Price Contingencies	0	0	0	2	1	8	3	25	5	45	3	26	3	32	2	16	17	154	171		
3. Total B	0	0	3	34	10	89	22	202	31	287	15	139	15	145	7	64	103	960	1,063		

EGYPT

KUREIMAT POWER PROJECT

PROJECT COST TABLES

IN THOUSAND US\$

	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92		FY99	
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL	TOTAL

C. Training Equipment **																				
1. Supply and Installation	0	0	14	133	36	333	79	732	108	998	50	466	50	466	22	200	359	3,328	3,667	
2. Duties and Taxes	0		7		17		37		51		24						136	0	136	
3. Subtotal	0	0	21	133	53	333	116	732	159	998	74	466	50	466	22	200	495	3,328	3,823	
4. Physical Contingencies	0	0	2	13	5	33	12	73	16	100	7	47	5	47	2	20	49	333	382	
5. Subtotal	0	0	23	146	58	366	128	805	175	1,098	81	513	55	513	24	220	544	3,661	4,205	
6. Price Contingencies	0	0	1	9	6	37	18	115	33	206	19	120	16	145	8	73	101	705	806	
7. Total C	0	0	24	155	64	403	146	920	208	1,304	100	633	71	658	32	293	645	4,366	5,011	
D. Project & Financial Management System																				
1. Consultancy Service **	0	0	7	64	17	161	35	356	51	485	25	243	25	243	9	81	169	1,633	1,802	
2. Price Contingencies	0	0	0	4	2	16	5	51	10	91	6	57	7	69	3	27	33	315	348	
3. Total D	0	0	7	68	19	177	40	407	61	576	31	300	32	312	12	108	202	1,948	2,150	
E. System Hardware and Software																				
1. Supply and Installation	0	0	3	42	11	105	24	236	33	316	17	158	17	158	4	45	109	1,060	1,169	
2. Duties and Taxes	0		2		5		12		16		8		8		2		53	0	53	
3. Subtotal	0	0	5	42	16	105	36	236	49	316	25	158	25	158	6	45	162	1,060	1,222	
4. Physical Contingencies	0	0	1	4	2	11	4	24	5	32	3	16	3	16	1	5	19	108	127	
5. Subtotal	0	0	6	46	18	116	40	260	54	348	28	174	28	174	7	50	181	1,168	1,349	
6. Price Contingencies	0	0	0	3	2	12	6	37	10	65	7	41	8	49	2	17	35	224	259	
7. Total E	0	0	6	49	20	128	46	297	64	413	35	215	36	223	9	67	216	1,392	1,608	
F. Load Management Equipment																				
1. Supply and Installation	0	0	0	28	0	69	0	153	0	139	0	106	0	10			0	505	505	
2. Duties and Taxes	0		1		4		8		7		5		1		0		26	0	26	
3. Subtotal	0	0	1	28	4	69	8	153	7	139	5	106	1	10	0	0	26	505	531	
4. Physical Contingencies	0	0	0	3	0	7	1	15	1	14	1	11	0	1	0	0	3	51	54	
5. Subtotal	0	0	1	31	4	76	9	168	8	153	6	117	1	11	0	0	29	556	585	
6. Price Contingencies	0	0	0	2	0	8	1	24	2	29	1	27	0	3	0	0	4	93	97	
7. Total F	0	0	1	33	4	84	10	192	10	182	7	144	1	14	0	0	33	649	682	
8. Total IV -Technical Assistance	268	274	599	2,153	1,567	5,597	2,974	10,828	3,191	11,919	2,139	7,773	605	2,817	60	532	11,403	42,493	53,896	
TOTAL PROJECT COST	2,283	6,414	14,674	58,311	35,674	133,481	63,226	237,235	75,225	288,282	44,047	177,100	18,550	74,645	5,058	24,665	260,737	1,000,133	1,260,870	

EGYPT

SOURIHMAT POWER PROJECT

PROJECT COST TABLES

	IN THOUSAND US\$																		
	FY92		FY93		FY94		FY95		FY96		FY97		FY98		FY99		FY92	FY99	TOTAL
	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	LOCAL	FOREIGN	
V. Reserve Procurement																			
1. Installation of Gas Pipeline			227		455		682		1364		1364		455				4,547	0	4,547
2. Duties and Taxes	0		0		0		0		0		0		0		0		0	0	0
3. Subtotal	0	0	227	0	455	0	682	0	1,364	0	1,364	0	455	0	0	0	4,547	0	4,547
4. Physical Contingencies	0	0	23	0	46	0	68	0	136	0	136	0	46	0	0	0	455	0	455
5. Subtotal	0	0	250	0	501	0	750	0	1,500	0	1,500	0	501	0	0	0	5,002	0	5,002
6. Price Contingencies	0	0	15	0	51	0	107	0	282	0	351	0	142	0	0	0	948	0	948
7. Total V	0	0	265	0	552	0	857	0	1,782	0	1,851	0	643	0	0	0	5,950	0	5,950
VI. Interest During Construction																			
1. Bank Financed		137		943		2,376		5,397		9,885		13,729					0	32,467	32,467
2. Others		35		1,227		5,260		13,788		26,964		39,559					0	86,833	86,833
TOTAL VI -Interest During Constrm.	0	172	0	2,170	0	7,636	0	19,185	0	36,849	0	53,288	0	0	0	0	0	119,300	119,300
TOTAL FINANCING REQUIRED (I+..VI)	2,283	6,586	14,939	60,481	36,226	141,117	66,083	256,420	77,007	325,131	45,898	230,388	19,193	74,645	5,058	24,665	266,687	1,119,433	1,386,120

EGYPT

KUREIMAT POWER PROJECT

Loan Disbursement Schedule
(in US\$ million)

<u>Bank Fiscal Year</u> <u>Quarter Ending</u>	<u>Quarterly</u> <u>Disbursements</u>	<u>Cumulative</u> <u>Disbursements</u>	<u>Disbursement</u> <u>as % of Total</u>
<u>FY 1992</u>			
March 31, 1992	0.0	0.0	0.0%
June 30, 1992	0.0	0.0	0.0%
<u>FY 1993</u>			
September 30, 1992	0.0	0.0	0.0%
December 31, 1992	9.0	9.0	4.1%
March 31, 1993	0.0	9.0	4.1%
June 30, 1993	1.5	10.5	4.8%
<u>FY 1994</u>			
September 30, 1993	7.1	17.6	8.0%
December 31, 1993	7.1	24.7	11.2%
March 31, 1994	7.0	31.7	14.4%
June 30, 1994	6.6	38.3	17.4%
<u>FY 1995</u>			
September 30, 1994	13.2	51.5	23.4%
December 31, 1994	13.3	64.8	29.5%
March 31, 1995	13.1	77.9	35.4%
June 30, 1995	13.4	91.3	41.5%
<u>FY 1996</u>			
September 30, 1995	16.7	108.0	49.1%
December 31, 1995	16.7	124.7	56.7%
March 31, 1996	16.8	141.5	64.3%
June 30, 1996	16.8	158.3	72.0%
<u>FY 1997</u>			
September 30, 1996	9.1	167.4	76.1%
December 31, 1996	9.0	176.4	80.2%
March 31, 1997	9.1	185.5	84.3%
June 30, 1997	8.6	194.1	88.2%
<u>FY 1998</u>			
September 30, 1997	4.8	198.9	90.4%
December 31, 1997	4.8	203.7	92.6%
March 31, 1998	4.9	208.6	94.8%
June 30, 1998	4.7	213.3	97.0%
<u>FY 1999</u>			
September 30, 1998	2.4	215.7	98.0%
December 31, 1998	2.1	217.8	99.0%
March 31, 1999	2.2	220.0	100.0%

1/ Based on the disbursement profile for EMENA power sector and modified to take into account the establishment of the special fund.

EGYPT

KUREIMAT POWER PROJECT

Project Monitoring Guidelines

1. The monitoring guidelines given below indicate the broad requirements and supplement the Borrower's obligation according to the Loan and Project Agreements. These requirements could be modified if circumstances so require.

General

2. Records will be maintained giving planned and actual achievements, to be reviewed annually or at agreed intervals for the following:

- (a) installed and derated capacity in MW for each of the power stations and according to types (such as hydro, thermal, diesel, combustion turbines);
- (b) energy capabilities in MW GWh/year by each power station;
- (c) maximum demand in MW and units generated in GWh by each power station;
- (d) station use in GWh by each power station;
- (e) fuel consumed in mt/m³ by fuel type and type of units in each power station;
- (f) sales in GWh to consumers and number of consumers according to consumer categories;
- (g) transmission and distribution (line) losses;
- (h) planned and forced outages (by classification) in power stations and in transmission and distribution network;
- (i) monthly maximum demand in MW (gross) for the interconnected system;
- (j) quality of supply to the consumers (number of interruptions, duration classified according to causes and voltage conditions at the consumer end);
- (k) annual system load duration curve for the interconnected system;
- (l) plant and load factors and plant availability;
- (m) the results of the environmental monitoring of Kureimat thermal power station (6 monthly report); and

- (n) EEA investment plan and annual budget by activity in local and foreign costs.
- (o) EEA staff (permanent and temporary) categorized by specialization and by cadre (such as generation, transmission, billing and others).
- (p) Operation and maintenance cost data for power stations and transmission system.

Project Implementation

3. Records will be maintained showing original schedule against actual achievements and supplied to the Bank at agreed intervals on the following aspects:

- (a) procurement action by bid packages (bid specifications, bid invitation, opening of bids, bid evaluation, award of contract, signing of contract and contract price as amended from time to time);
- (b) physical progress according to project components and contracts (highlighting critical activities and bottlenecks);
- (c) actual project costs and expenditures (local and foreign) and estimated remaining expenditure (local and foreign) projected quarterly through project completion;
- (d) disbursement schedule (for the Bank loans and other loans);
- (e) information on problems encountered during implementation (including major mishaps) and expected impact on commissioning schedules; and
- (f) minutes of the meetings and progress reports of the consultants.

EGYPT

KUREIMAT POWER PROJECT

Project Supervision Plan

1. The Bank would normally supervise the project twice a year. The core team for the supervision mission would comprise a power engineer and a financial analyst. The core team would be joined, as and when necessary, by an economist, a technical expert in generation and transmission, and an environmental specialist. The table below gives the staffweeks estimated for the supervision effort for the project for FY92-99. The staffweeks given in the table are staff/consultant inputs in the field and at the headquarters.

<u>FISCAL YEAR</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>
1. Power Engineer	5	5	5	5	4	4	4	3
2. Financial Analyst	5	5	5	5	4	4	4	3
3. Technical Expert		1	1	1				
4. Environmental Expert		1	1		1			1
5. Economist				1		1		1
6. Total Staffweeks	<u>10</u>	<u>12</u>	<u>12</u>	<u>12</u>	<u>9</u>	<u>9</u>	<u>8</u>	<u>8</u>

EGYPT

KUREIMAT POWER PROJECT

Environmental Impact Assessment

A. General

1. In 1985, the Environmental Assessment Report (EIAR) for the Kureimat power station site was prepared on the basis of a feasibility study for a coal-fired power station. However, with the change in the availability of natural gas (para. 4.01 of the main report), the feasibility study for the Kureimat power station was revised on the basis of a dual fuel (natural gas and fuel oil) fired power station. The EIAR was accordingly revised in 1990 by the consultants, S & W. The Bank received the draft report in May 1991 and the environmental assessment summary (based on the draft EIAR) submitted by EEA was circulated to the Board on July 11, 1991. The appraisal mission reviewed with EEA and USAID the draft final report submitted by the consultants. The consultants, after incorporating the comments furnished by the Bank, USAID and EEA, submitted the final Environmental Impact Assessment Report (EIAR) by the end of July 1991. The final report and recommendations of the consultants, that the Kureimat site is environmentally acceptable for location of the Kureimat power station, were found to be satisfactory by the Bank. The final EIAR is available in the project files. The project falls under the category "A" in accordance with Annex A of the Operational Directive 4.0. Paras. 4.31 through 4.37 of the main report give the important environmental issues involved in the project. The following paragraphs give additional details about the environmental aspects involved in the project.

B. Location

2. Para. 4 of Annex 4.1 gives details about the geographical location of the power station site. The site is on the eastern banks of the Nile river and occupies the western edge of a relatively undeveloped Galala Plateau which has a desert environment. Three Wadis -- Wadi Ramliya, Wadi Mitin El Bahry and Wadi Mitin El Quibly -- near the site drain into the Nile river from the west slope of the plateau. The riverbank near the plant site is generally steep and consists of small floodplain areas. The power station is located just above the floodplain and is downstream of the Kureimat island. No villages or individual residences are located on the site. EEA is in legal possession of the land acquired for the power station and as mentioned in para. 4.26 of the main report and para. 4 of Annex 4.1, about 210,000 m² of land along the river out of 840,000 m² of the land acquired by EEA for the Kureimat site, was cultivated by about 50 farmers. EEA is willing to pay compensation to the farmers as determined by the committee appointed by ESA and, to minimize social stress to the farmers, EEA has agreed to give priority to the farmers or their children for employment at the project site. EEA has also agreed to use its influence with the Giza Governorate to give priority to

the farmers for allocation of the reclaimed land in the nearby areas. The nearest village to the site is El Mimone (population 1,259) about 1 km to the south of the site. The nearest commercial and the Government center to the site is the Kureimat village (population 1,787) about 2 km north of the site.

C. Cultural Resources

3. Based on the Preliminary Archeological Assessment carried out by the consultants, no known cultural resources occur near the site. This conclusion was also supported by the background research carried out by the office of Public Archeology at the Boston University. The list of wildlife that are designated by USAID as endangered species was reviewed for the site. Considering the present situation, the list narrows down to review of the five species, namely: (a) the desert monitor, (b) the Nile crocodile, (c) the Dorcas and slender horned gazelle, (d) the cheetah and (e) the migratory Eurasian peregrine falcon. The chances of occurrence of (a), (b), (c) and (d) near the site are very rare. The falcon (d) might be attracted to the wintering water fowl and other bird prey species that frequent the Nile valley. However, there are no unique features of the Kureimat site that might specifically lure the peregrines or their prey and, therefore, the probability of peregrines using the resources of the site are very low.

D. Land Use

4. The present land use at the site is limited to agriculture in the wedge-shaped floodplain between the marsh area and the plateau, and in the Wadi confluences. EEA has acquired the land for the power station and the colony. Details of the land use are given in paras. 4, 8 and 9 of Annex 4.1. About 73 percent of the total site surface that would be modified during construction is located on the desert plateau. The vegetation is sparse on the desert plateau, and the wildlife use on the desert plateau is minor and sporadic. The balance of 27 percent of the site surface that would be modified is in the floodplain along the river. Within the Nile river valley, the floodplain vegetation is primarily agricultural and is the primary habitat for resident and migratory wildlife. The loss of wildlife habitat at the Kureimat site due to construction activities is minor in terms of total habitat available in the reach of the valley. Hence, the vegetation and wildlife habitat that would be modified as a result of construction and operation of the power station is insignificant in terms of the total amount of similar habitat available in the Kureimat area and in the reach of the Nile river valley.

E. Water Use and Water Quality

5. The main source of water intake for the power station and the colony is the Nile river and consists of: (a) circulating water required for the condensers (para. 4.33 of the main report); (b) service water for boiler make-up and plant services including fire protection water; and (c) potable water for the colony and the power station. To avoid fouling of condenser tube surfaces with marine organisms, the river water prior to circulation

through the condensers would be chlorinated. Boiler make-up water would be appropriately treated (pre-treatment, clarification and demineralization) in the water treatment plant for use in the high pressure boilers. Potable water would be appropriately chlorinated, clarified and filtered. Currently, the controlled seasonal flow of the river passing the site varies from about 52,000 m³/min to 97,200³/min. The circulating water requirement of about 2,400 m³/min is a non-consumptive use, and about half of the service and potable water requirement (of about 2m³/min to 5³/min) would be returned to the river after use and after being treated in the wastewater treatment plant.

6. The reaction time for the chlorine in the circulating water flowing through the condensers before discharging in the river is adequate to decompose the chlorine so that the residual chlorine content in the circulating water discharged in the river would be well within the limits stipulated by USEPA and the Bank (0.1 mg/liter and 0.3 mg/liter respectively). All wastewater from the power station would be treated in the wastewater treatment plant comprising: (a) lined waste holding ponds (to limit lechtate discharge to groundwater) to receive all non-sanitary plant wastewater comprising floor and equipment drainage, make-up demineralizer regeneration wastewater, boiler blowdown, condensate polisher regeneration wastewater, service water clarifier underflow, boiler washing wastes and boiler chemical cleaning wastewater; (b) an oil/water separator for removal of floating oil from floor and equipment drainage prior to the waste holding ponds; (c) chemical feed systems; (d) a clarifier system; and (e) a sludge dewatering system. The quality of treated wastewater discharged in the river would be within the Bank and Egyptian guidelines.

7. Circulating water (which increases its temperature by about 10°C while extracting heat from the exhaust steam in the condensers) discharged in the river forms a thermal plume with a surface temperature of about 3°C above the ambient river water temperature. Under the worst case scenario in summer (on occasions during the months of August through October) the surface temperature of the river water would not exceed 35°C in the immediate area of discharge and is within the limits laid down under the Governmental Decree No. 8 of 1983 concerning Law No. 48 of 1982. The temperature of 35°C is tolerated by the fish life in the river except the tilapia fish which has a tolerance level of about 30°C. During the remaining months of November through July, the plume temperature in the vicinity of discharge will not exceed 30°C and would pose no problem for the tilapia fish. Therefore, the telapia fish which would avoid the small high temperature area on occasions in summer months is likely to actively seek the warmer temperature water in the thermal plume during winter days.

F. Ambient Air Quality

8. At present there is no air quality monitoring stations in the site vicinity. Therefore, the project provides for the establishment of environmental monitoring stations at the site during the preconstruction phase of the project to ensure that measurements of background pollution are available for at least a period of one year prior to the commencement of construction activities at the site (para. 12, Annex 4.1). A mathematical

dispersion model was used to calculate 24-hour and annual-average ground level pollutant concentrations as a function of downwind distance and direction from the power station. The maximum concentrations of pollutant in micrograms/m³ as predicted by the model are given below. It is seen from the predictions of the model that pollutant emissions from the Kureimat power station would result in some degradation of air quality in the vicinity of the Kureimat site; however, even under the worst case scenario of using 100 percent fuel oil in the boilers at the power station, the air quality is well within the acceptable limits stipulated by MOH, WB and USEPA.

<u>Pollutant</u>	<u>Operating Mode</u>			<u>Air Quality Standards</u>		
	<u>100% Gas</u>	<u>100% Fuel Oil</u>	<u>50%/50% Gas/Fuel Oil</u>	<u>MOH</u>	<u>WB</u>	<u>USEPA</u>
Sulfur Dioxide						
▶ 24-hour	0.06	143.8	71.9	200	500	365
▶ Annual	0.01	15.3	7.7	60	100	80
Nitrogen Dioxide						
▶ 24-hour	13.9	15.7	14.6	150	-	-
▶ Annual	1.5	1.7	1.6	-	100	100
Particulates						
▶ 24-hour	0.30	10.2	5.3	200	500	150
▶ Annual	0.03	1.1	0.6	-	100	50

Notes: MOH - Ministry of Health, WB - World Bank, and USEPA - United States Environmental Protection Agency.

G. Stack Emissions - NO_x, SO_x and Particulates

9. The Bank standards for Nitrogen oxide (NO_x) emissions of 86 nanograms/joule for natural gas and 130 nanograms/joule for fuel oil would be observed. Care would be taken during engineering design of boilers and burners to ensure compliance with the Bank standards for NO_x emissions.

10. The total sulfur oxide (SO_x) emissions are almost entirely dependent on the sulfur content of the fuel used in the boilers. The sulfur content in the natural gas (maximum 10 parts per million by weight) and fuel oil (2.5 percent to 3 percent by weight) available in the country does not pose any problem for compliance with the Bank standards even if the boilers are fired with 100 percent fuel oil or natural gas. Under the worst case scenario, burning 100 percent fuel oil (containing 2.5 percent sulfur) in the boilers would result in SO_x emissions of 380 mt/day against the Bank stipulations of 500 mt/day for Kureimat power station located in the unpolluted rural area. The Bank limit would be exceeded only when burning 100 percent fuel oil having 3.3 percent sulfur.

11. The particulate emissions from the stack of the boilers comprise fuel ash, fuel additives, acid mist, unburnt carbon and mist. The Bank limit for particulate emissions for sites like Kureimat located in rural areas having low background pollution levels is 150 mg/m³. The firing of 100

percent natural gas in the boilers at the Kureimat site poses no problem; however, firing of 100 percent fuel oil (with 2.5 percent sulfur) in the boilers would result in particulate emissions of 252 mg/m³ against the Bank stipulation of 150 mg/m³. Therefore, taking account the likely variation of sulfur (2.5 percent to 3 percent) occurring in the fuel oil available in Egypt and to ensure compliance with the Bank emission standards, EGPC has agreed to supply adequate quantities of natural gas to cover at least 50 percent of the fuel required for the lifetime of the operation of the Kureimat power station. In addition, EGPC would supply adequate quantities of fuel oil to cover the balance 50 percent of the fuel requirements of the power station.

H. Noise Pollution

12. Noise pollution would result from activities during the construction and operation of the power station. The greatest impact of noise pollution would be on the nearest village of Mimone situated about one km from the site. During the engineering design phase, care would be taken to ensure that the power station equipment meets the Bank guidelines regarding acceptable noise levels in the power station. Further, in addition to the stipulations regarding control of dust, and disposal of debris and waste, the bid documents would stipulate conditions requiring the contractors to abide by the Bank guidelines while using construction equipment at the site. EEA would also ensure that the construction activities at night causing dust and noise pollution would be kept to the minimum.

I. Gas Pipeline and Transmission line Corridors

13. The proposed gas pipeline and transmission line corridors for the project were reviewed by the consultants and were found to be environmentally acceptable. During the construction phase, EEA/EGPC would ensure that the damage to the agricultural produce is kept to the minimum and compensation for the damage is expeditiously paid to the farmers.

J. Environmental Management and Training

14. To effectively manage the environmental activities at the site, EEA has agreed to establish an Environmental Management Unit (EMU) as an integral part of the power plant organization (para. 4.37 of the main report). During the preconstruction and construction phases, the unit would coordinate environmental activities with the engineering consultants responsible for the procurement and installation of environmental monitoring stations, and measurements of background pollution at the site. During the commissioning and operation phases of the power station, EMU would take control of the environmental activities at the site and design, implement and monitor a health and hazard safety plan for the power station. To ensure that qualified and experienced staff is available for the activities of EMU, USAID has agreed to provide funding for the training of EMU staff. In addition, the suppliers of the environmental monitoring station equipment provide training to EEA staff for operation and maintenance of the equipment.

EGYPT

EGYPTIAN ELECTRICITY AUTHORITY

KUREIMAT POWER PROJECT

Actual, Estimated and Projected Income Statements

Fiscal Year Ending June 30	Actual						<-Est'd->		Projected						
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	(LE Millions unless otherwise stated)														
Sales (GWh)	26,168	28,655	31,215	33,419	35,083	37,426	39,528	41,714	44,045	46,310	48,737	51,287	53,524	56,265	58,723
Ave. Price M/kWh sold	10.99	15.37	16.44	21.99	23.96	30.54	43.29	63.78	84.13	109.68	134.57	156.53	166.22	177.03	188.70
<u>Operating Revenues</u>															
Sales of Electricity	288	440	513	735	840	1,143	1,711	2,661	3,706	5,079	6,559	8,028	8,897	9,961	11,081
Other Operating revenues					1	1	1	1	2	2	2	2	2	2	2
Total Operating revenues	288	441	513	735	841	1,144	1,712	2,662	3,707	5,081	6,560	8,030	8,899	9,963	11,083
<u>Operating Expenses</u>															
Fuel	89	123	147	256	266	333	500	861	1,472	2,099	2,957	3,858	4,131	4,870	5,680
Wages & Salaries	39	44	48	58	70	82	102	117	162	182	199	214	230	247	266
Materials & Services	31	37	81	62	112	138	146	156	178	199	219	240	263	286	313
Admin. Expenses	42	50	38	43	52	61	73	94	108	117	124	130	137	144	151
Depreciation	71	126	153	133	180	243	324	373	450	610	752	838	1,023	1,261	1,397
Total Operating Expenses	272	380	467	553	680	857	1,145	1,620	2,368	3,207	4,251	5,281	5,784	6,808	7,807
Operating Income/(Loss)	16	60	46	182	161	287	568	1,042	1,339	1,873	2,309	2,749	3,115	3,155	3,276
Net Non Operating Income	36	18	81	2	31	1	1	1	1	1	1	1	1	1	1
Net Income /(Loss) Before Int.	52	78	127	184	192	287	568	1,043	1,340	1,875	2,311	2,750	3,116	3,156	3,277
Gross Interest	68	117	149	247	284	432	477	545	563	631	794	1,145	1,552	1,874	2,148
Less IDC	27	46	35	76	116	169	162	160	206	230	177	351	526	489	512
Interest Expenses	42	70	114	171	168	263	315	385	358	401	617	795	1,026	1,385	1,636
Foreign Exchange Losses							20	80	44	28	15	10	13	16	19
Net Income /(Loss)	10	8	13	13	24	24	233	578	938	1,446	1,679	1,945	2,077	1,756	1,623
Net Internal Cash Generation	10	(32)	(3)	(10)	(177)	(221)	(130)	406	884	1,532	1,888	2,265	2,544	2,449	2,443
Average Construction Exp	719	682	1,487	1,780	2,268	1,677	1,677	1,879	2,978	4,196	5,198	5,954	6,518	6,548	6,346
Self-Financing Level(%)	1%	-5%	0%	-1%	-8%	-13%	-8%	22%	30%	37%	36%	38%	39%	37%	38%
Rate of return (%)	1.4%	3.5%	2.0%	5.0%	3.1%	4.5%	7.2%	11.6%	12.4%	12.6%	12.7%	13.8%	12.9%	10.6%	10.1%

EGYPT

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KUREIMAT POWER PROJECT

Actual, Estimated and Projected Balance Sheets

Fiscal Year Ending June 30	Actual					<-Est'd>		Projected							
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	(LE Millions unless otherwise stated)														
Fixed Assets	1,731	2,601	3,082	5,634	6,440	8,472	10,035	11,270	14,416	20,468	22,531	25,362	33,070	38,968	40,833
Accum.Depr.	366	481	630	747	925	1,166	1,489	1,862	2,312	2,922	3,675	4,513	5,535	6,796	8,193
Net Fixed Assets	1,365	2,119	2,452	4,888	5,515	7,307	8,546	9,407	12,104	17,545	18,856	20,849	27,534	32,172	32,640
Work in progress	1,104	1,038	1,055	1,661	2,537	2,469	2,290	2,739	2,161	791	4,065	6,808	6,052	7,181	10,980
Total Fixed Assets	2,468	3,157	3,507	6,549	8,052	9,776	10,836	12,146	14,265	18,336	22,921	27,657	33,586	39,353	43,620
Investments	53	53	53	56	56	56	56	56	56	56	56	56	56	56	56
Long -Term Loans	37	39	36	106	131	173	106	106	106	106	106	106	106	106	106
Total Long -Term Assets	2,558	3,250	3,597	6,711	8,240	10,005	10,998	12,309	14,427	18,498	23,083	27,819	33,748	39,516	43,782
Deferred Liabilities							383	1,498	741	381	113	4	48	93	128
Current Assets															
Cash	55	150	165	135	131	189	90	129	605	1,561	2,516	3,898	5,720	7,420	9,403
Accs.Receivable	69	132	191	305	388	524	784	665	926	1,270	1,640	2,007	2,224	2,490	2,770
Other Acc.Receivable	68	121	210	204	253	260	286	315	346	381	419	461	507	558	614
Inventories	132	158	197	242	344	434	512	575	735	1,044	1,149	1,293	1,687	1,987	2,082
Total Current Assets	325	561	764	886	1,116	1,407	1,672	1,684	2,613	4,256	5,724	7,659	10,138	12,455	14,869
Current Liabilities															
Accounts Payable	13	20	18	24	22	33	83	144	245	350	493	643	689	812	947
Other Accounts Payable	83	133	148	604	996	740	830	635	968	1,765	2,012	2,101	2,621	2,650	2,135
Accruals	5	25	23	80	109	78	123	187	288	390	525	666	714	832	962
Customer Deposits	24	24	21	25	41	35	25	30	46	84	96	100	125	127	102
Min.of Finance	183	281	340	590	870	1,190	1,190	1,190	1,190	1,190	1,190	1,190	1,190	1,190	1,190
Total Current Liabilities	309	483	549	1,323	2,038	2,076	2,252	2,185	2,737	3,778	4,316	4,701	5,338	5,610	5,335
Net Current Assets	16	78	215	(436)	(922)	(669)	(580)	(501)	(124)	477	1,408	2,958	4,799	6,845	9,534
Total Assets	2,574	3,328	3,811	6,274	7,318	9,336	10,802	13,305	15,044	19,357	24,605	30,782	38,595	46,454	53,445
Financed as Follows:															
Capital	651	651	651	651	651	1,570	1,570	2,786	2,786	2,786	2,786	2,786	2,786	2,786	2,786
Reserves	213	272	402	410	426	465	527	603	718	929	1,169	1,420	1,733	2,049	2,304
Provisions	4	4	4	3	5	5	3	3	3	3	3	3	3	3	3
Profit & Loss	28	36	49	62	86	110	343	921	1,859	3,305	4,984	6,929	9,006	10,762	12,385
Total Equity	895	963	1,105	1,126	1,168	2,150	2,444	4,313	5,367	7,023	8,942	11,138	13,528	15,600	17,478
Loans															
Foreign	1,072	1,457	1,574	3,607	4,162	5,913	6,660	8,485	9,171	11,828	15,157	19,169	24,627	30,448	35,594
Local	607	909	1,132	1,542	1,987	1,273	1,699	507	507	507	507	475	441	407	373
Total Loans	1,679	2,365	2,706	5,148	6,149	7,186	8,359	8,992	9,678	12,335	15,663	19,644	25,068	30,854	35,967
Total Financing	2,574	3,328	3,811	6,274	7,318	9,336	10,802	13,305	15,045	19,357	24,605	30,782	38,596	46,454	53,445

EGYPT
EGYPTIAN ELECTRICITY AUTHORITY
KUREIMAT POWER PROJECT

Actual, Estimated and Projected Statements of Sources and Application of Funds

Fiscal Year Ending June 30	Actual						Est'd		Projected						
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	(LE Millions unless otherwise stated)														
Internal Sources															
Net Income Before Interest	52	78	127	184	192	287	568	1,043	1,340	1,875	2,311	2,750	3,116	3,156	3,277
Depreciation	67	116	150	118	180	243	324	373	450	610	752	838	1,023	1,261	1,397
Gross Internal Cash Generation	118	194	277	302	372	530	892	1,416	1,789	2,485	3,063	3,588	4,138	4,417	4,674
Debt Service:															
Amortization	67	155	166	141	382	489	707	625	547	552	558	529	569	583	595
Interest	42	70	114	171	168	263	315	385	358	401	617	795	1,026	1,385	1,636
Total Debt Service	109	226	280	312	550	752	1,022	1,010	905	953	1,175	1,324	1,595	1,967	2,231
Net Internal Cash Generation	10	(32)	(3)	(10)	(177)	(221)	(130)	406	884	1,532	1,888	2,265	2,544	2,449	2,443
External Sources															
External Project Loans															
IBRD Loan									47	120	250	326	182	98	33
African Dev. Bank									68	196	422	510	316	139	43
Arab Fund									41	89	154	186	104	27	0
USAID								4	43	101	159	284	239	95	46
Other Foreign Loans							993	1,253	1,746	3,024	3,155	3,303	5,094	5,950	5,532
Local Loans	731	842	506	2,335	1,383	1,525	483	24							
Total Borrowings	731	842	506	2,335	1,383	1,525	1,476	1,280	1,946	3,540	4,140	4,609	5,935	6,309	5,654
Saudi Govt. Grant for Project							0	20	45	73	78	27	0	0	0
Other Grants	22	58	129	7	16	39	62	56	71	137	163	224	313	316	255
Equity						919	0	1,216	1/						
Provisions	0	(0)	(0)	(1)	2	0	(2)								
Total Sources	763	867	632	2,331	1,224	2,262	1,406	2,977	2,946	5,283	6,269	7,124	8,792	9,074	8,352
Application of Funds															
Construction Expenditure															
For Project							10	32	268	653	1,209	1,470	916	397	135
Other Projects	745	804	498	3,159	1,682	1,964	1,374	1,652	2,300	4,029	4,128	4,104	6,035	6,631	5,529
Total Capital Expenditures	745	804	498	3,159	1,682	1,964	1,384	1,683	2,568	4,682	5,337	5,574	6,951	7,028	5,663
Debt Equity Conversion								1,216							
Increase/(Decrease) in Working Capital excl. Cash		95	15	(30)	(4)	58	189	39	(99)	(354)	(24)	168	19	346	706
Increase/(Decrease) in Other A	(18)	3	(3)	73	26	42	(67)								
	728	902	510	3,201	1,703	2,064	1,506	2,938	2,469	4,327	5,313	5,742	6,970	7,374	6,369
Increase/(decrease) in Cash	35	(34)	122	(870)	(480)	198	(99)	39	476	956	955	1,382	1,822	1,700	1,983
Total Applications	763	867	632	2,331	1,224	2,262	1,406	2,977	2,946	5,283	6,269	7,124	8,792	9,074	8,352

1/ Represents EEA local currency L-T loans owed to the National Investment Bank which was expected to be converted into equity at appraisal. Following conclusion of negotiations, the Government decided to convert a lower amount of about LE 1.14 billion. The difference in the amount of the conversion does not materially affect the projections for FY93 onwards.

EGYPT
EGYPTIAN ELECTRICITY AUTHORITY
KUREIMAT POWER PROJECT
Unit Revenues and Costs

Fiscal Year Ending June 30	Actual					Est'd		Projected							
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Milliemes Per KmH Unless Stated Otherwise															
Sales (GMh)	26,168	28,655	31,215	33,422	35,084	37,426	39,528	41,714	44,045	46,310	48,737	51,287	53,524	56,265	58,723
Sales of Electricity ¹	10.99	15.37	16.44	21.99	23.95	30.54	43.29	63.78	84.13	109.68	134.57	156.53	166.22	177.03	188.70
Other Operating Revenue	0.01	0.01	0.01	0.01	0.03	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Operating Expenses															
Fuel ²	3.41	4.29	4.72	7.66	7.58	8.88	12.64	20.64	33.42	45.33	60.66	75.23	77.19	86.56	90.73
Wages & Salaries	1.49	1.54	1.55	1.74	2.00	2.20	2.58	3.28	3.67	3.92	4.07	4.16	4.29	4.39	4.53
Materials & Services	1.18	1.29	2.58	1.86	3.19	3.69	3.69	3.74	4.04	4.29	4.49	4.69	4.92	5.08	5.33
Admin. Expenses	1.61	1.74	1.22	1.29	1.48	1.63	1.85	2.24	2.44	2.53	2.55	2.54	2.56	2.56	2.57
Depreciation	2.71	4.40	4.89	3.98	5.13	6.50	8.19	8.94	10.21	13.18	15.44	16.34	19.10	22.41	23.78
Total Operating Expenses	10.39	13.26	14.96	16.53	19.38	22.90	28.96	38.84	53.77	69.26	87.22	102.97	108.06	121.00	132.95
Operating Income/Loss	0.61	2.12	1.49	5.47	4.60	7.66	14.36	24.97	30.40	40.46	47.39	53.60	58.20	56.07	55.79
Non-Operating Income	1.38	0.63	2.60	0.06	0.88	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Net Income Before Interest	1.99	2.75	4.09	5.53	5.48	7.67	14.38	24.99	30.42	40.48	47.41	53.62	58.22	56.09	55.81
Interest Expenses	1.61	2.44	3.66	5.12	4.79	7.03	7.97	9.23	8.12	8.66	12.65	15.50	19.17	24.61	27.85
Foreign Exchange Losses							0.51	1.91	1.00	0.60	0.31	0.20	0.24	0.28	0.32
Net Income/ (Loss)	0.38	0.31	0.43	0.41	0.69	0.64	5.90	13.85	21.30	31.22	34.45	37.92	38.81	31.20	27.64
Net Profit Margin	3.5%	1.8%	2.5%	1.8%	2.8%	2.1%	13.6%	21.7%	25.3%	28.5%	25.6%	24.2%	23.3%	17.6%	14.6%
Net Profit Before Interest	17.9%	17.8%	24.8%	25.1%	22.8%	25.1%	33.2%	39.2%	36.1%	36.9%	35.2%	34.2%	35.0%	31.7%	29.6%

^{1/} Average tariff increases of 35%, 29%, 30%, 30% and 35% were implemented in FY86, FY87, FY88, FY89 and FY90.

^{2/} Prices of fuel products use for power generation were increased by as follows: fuel oil by 87%, 25% and 43% in FY87, FY89 and FY90 respectively; and diesel oil by 100% in FY89 and 55% in FY90 respectively. The price of diesel oil had been reduced by about 37.5% in FY87 so as to bring prices paid by EEA in line with those paid by other consumers.

EGYPT
KUREIMAT POWER PROJECT
EGYPTIAN ELECTRICITY AUTHORITY
Financial Performance Ratios

Fiscal Year Ending June 30	Actual						Est'd		Projected						
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Profitability Indicators															
Net Profit Margin	3.5%	1.8%	2.5%	1.8%	2.8%	2.1%	13.6%	21.7%	25.3%	28.5%	25.6%	24.2%	23.3%	17.6%	14.6%
Net Profit Margin Before Interest	17.9%	17.8%	24.8%	25.1%	22.8%	25.1%	33.2%	39.2%	36.1%	36.9%	35.2%	34.2%	35.0%	31.7%	29.6%
Return on Net Worth	1.1%	0.8%	1.2%	1.2%	2.1%	1.1%	9.5%	13.4%	17.4%	20.5%	18.7%	17.5%	15.3%	11.2%	8.8%
Return on Total Assets	1.8%	2.1%	2.9%	2.4%	2.1%	2.5%	4.5%	7.5%	7.9%	8.3%	8.0%	7.7%	7.1%	6.0%	5.4%
Return on Fixed Assets	2.0%	2.4%	3.5%	2.7%	2.3%	2.9%	5.2%	8.5%	9.3%	10.1%	10.0%	9.9%	9.2%	8.0%	7.4%
Liquidity Measures															
Current Ratio	1.05	1.16	1.39	0.67	0.55	0.68	0.74	0.77	0.95	1.11	1.32	1.64	1.94	2.30	2.92
Acid Test Ratio	0.62	0.83	1.03	0.49	0.38	0.47	0.52	0.51	0.68	0.83	1.05	1.36	1.62	1.95	2.50
Absolute Liquidity	0.18	0.31	0.30	0.10	0.06	0.09	0.04	0.06	0.21	0.40	0.57	0.84	1.11	1.41	1.87
Gearing Ratios															
Debt/Debt+Equity	65.2%	71.1%	71.0%	82.1%	84.0%	77.0%	77.4%	67.6%	64.3%	63.7%	63.7%	64.0%	65.3%	66.9%	68.0%
Total Assets/Total Equity	1.7	1.6	1.6	1.5	1.5	1.6	1.5	1.6	1.8	1.8	1.8	1.8	1.7	1.7	1.6
Debt Service Coverage	1.09	0.86	0.99	0.97	0.68	0.71	0.87	1.40	1.96	2.57	2.70	2.82	2.73	2.38	2.20
Activity Ratios															
Sales/Total Assets	0.10	0.12	0.12	0.10	0.09	0.10	0.14	0.19	0.22	0.22	0.23	0.23	0.20	0.19	0.19
Sales/Fixed Assets	0.11	0.14	0.14	0.11	0.10	0.11	0.16	0.22	0.26	0.27	0.28	0.29	0.26	0.25	0.25
Sales/Current Assets	0.89	0.78	0.67	0.83	0.75	0.81	1.02	1.58	1.43	1.21	1.15	1.04	0.86	0.77	0.71
Sales/Inventory	2.17	2.79	2.61	3.03	2.44	2.64	3.34	4.63	5.04	4.87	5.71	6.21	5.28	5.01	4.93
Sales/Receivables	4.17	3.34	2.68	2.41	2.17	2.18	2.18	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

EGYPT

EGYPTIAN ELECTRICITY AUTHORITY

KUREIMAT POWER PROJECT

Assumptions Underlying Financial Projections

A. Income Statements

1. Operating Revenues consist of revenues from EEA's sales of electricity to Electricity Distribution Companies and to a few major industrial and agricultural consumers. Revenues from these sales have been projected on the basis of expected future sales priced at tariffs consistent with the Government's stated objective of raising the average electricity tariff to reach the long-run marginal cost by June 30, 1995. For the years FY96 through FY99, the average electricity tariff has been adjusted for variations in crude oil prices, international inflation and exchange rate movements so as to maintain it at the LRMC level.

Fiscal Year Ending June 30	1991	1992	1993	1994	1995	1996	1997	1998	1999
(a) <u>Sales and Revenues</u>									
Sales	39,528	41,714	44,045	46,310	48,737	51,287	53,524	56,265	58,723
% of Growth	5.6	5.5	5.6	5.1	5.2	5.2	4.4	5.1	4.4
Avg Tariff (M/kWh)	43.3	63.8	84.1	108.7	134.6	156.5	166.2	177.0	188.7
Revenues (LE million)	1,711	2,661	3,706	5,079	6,559	8,028	8,897	9,961	11,081
(b) <u>Assumptions for Electricity Tariffs</u>									
(i) Crude Oil Prices (US\$/bbl)	19.50	17.55	17.90	19.05	20.25	21.86	23.86	26.04	28.43
(ii) Exchange Rate (LE per US\$1.00)	3.30	4.07	4.50	4.72	4.82	4.87	4.82	4.87	5.02
(iii) International Inflation (%)	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
(c) <u>Elements of the Average LRMC</u> (US cents/kWh)									
(i) Generation (incl. O & M)	1.29	1.34	1.39	1.45	1.50	1.56	1.62	1.69	1.75
(ii) Fuel	1.64	1.48	1.51	1.60	1.70	1.84	2.01	2.19	2.39
(iii) Trans. & Distr. (incl. O & M)	.89	0.82	0.96	1.00	1.04	1.08	1.12	1.16	1.21
(iv) Losses	.49	0.63	0.65	0.67	0.71	0.72	0.73	0.74	0.74
Total LRMC (US cents kWh)	4.31	4.37	4.51	4.72	4.95	5.20	5.48	5.78	6.09
M/kWh	142.44	177.86	202.75	221.91	238.34	252.93	269.33	287.10	305.84
(d) <u>Expected Average Tariffs (M/kWh)</u>									
(i) % of LRMC to be Achieved	59.00	69.00	80.00	90.00	100.00	100.00	100.00	100.00	100.00
(ii) Price (M/kWh) to be Achieved 1/	82.53	122.72	162.20	200.62	238.34	252.93	269.33	287.10	305.84
(iii) % increase to achieved target price (ii)	50.0	48.7	32.2	23.7	18.8	6.1	6.5	6.6	6.6
(e) <u>EEA average tariff (m/kWh) 2/</u>									
	60.51	79.77	105.43	130.40	154.92	164.40	175.07	188.62	188.86

1/ The target price to be achieved is the average electricity tariff for all electricity sales by EEA and EDES to the final consumers.

2/ On the assumption that the current internal transfer pricing system which aims to balance EEA's financial requirements against those of EACs would be continued. At present EEA's average tariff amount is about 65% of the system average tariff. The average electricity tariffs shown in (e) are higher than those in (a) because the average tariffs in (e) are those that are expected to be in effect after the annual increases (assumed in May) whereas the tariffs in (a) are the averages for the fiscal year which are used for revenue generation purposes.

2. Fuel Expenses. Fuel expenses have been projected on the basis of consumption forecasts of the principal fuels (fuel oil, natural gas and diesel oil) prepared by EEA and reviewed by the Bank appraisal mission and on price increases needed to raise the average prices of petroleum products to their international equivalent by FY95 as agreed with the Government. These assumptions are shown in detail below.

	<u>FY91</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>
(a) <u>Fuel Consumption (mts)</u>									
Fuel Oil	4,844	4,789	4,657	4,692	4,938	5,375	5,375	5,747	6,005
Natural Gas	3,854	4,330	4,867	5,339	5,907	6,150	6,440	6,679	6,914
Diesel Oil	106	157	232	275	324	383	195	225	258
Total	8,804	9,286	9,756	10,306	11,169	11,908	12,010	12,651	13,177
(b) <u>Fuel Prices</u>									
Fuel Oil	80	134	181	236	294	324	361	402	449
Diesel Oil	286	483	652	851	1,058	1,165	1,299	1,448	1,615
Natural Gas ^{1/}	96	161	217	284	353	388	433	483	538

^{1/} Natural gas prices are given per ton of natural gas which is equivalent to 1.2 tons of heavy fuel oil. Thus, on a calorific basis natural gas is priced at the same level as heavy fuel oil.

3. Salaries and Wages are based on EEA's salaries and wages bill in FY90 and escalated at the annual rate of local inflation (20% in FY91 decreasing to about 5% by FY96) as adjusted for an annual average increase in EEA employees of about 3%. The modest increase in employees is required because of EEA need to employ specialized staff to implement new projects.

4. Materials and Services are assumed to increase at the consumption weighted annual rate of local and foreign inflation, ranging from about 8.1% in FY92 to about 4.1 from FY96 when local inflation is expected to be lower.

5. Administration Expenses (mainly local costs) are assumed to increase at the annual rate of local inflation.

6. Depreciation is computed at an average annual rate of 3.0% of average gross fixed assets in service during the year.

7. Interest Expenses on all existing foreign loans has been calculated at the rate on the basis of data on loan amounts, repayment terms and interest rates provided by EEA. Interest on new loans is assumed at 16% for local loans from the National Investment Bank and the Treasury. These local loans are, however, expected to be minimal since EEA is projected to generate adequate cash to finance the local cost component of its investment program. All interest incurred during construction is added to work-in-progress.

B. Balance Sheets

1. Gross Fixed Assets in Service are valued on the historic cost convention. Transfers from work-in-progress to fixed assets in service were determined on a detailed analysis of EEA's investment program and on expected completion date of the assets to be acquired or completed during the period FY91 through FY99. A breakdown of the assets expected to be added to gross fixed assets in service during this period is provided below.

Fiscal Year Ending June 30	1991	1992	1993	1994	1995	1996	1997	1998	1999
Gross Fixed Assets Additions									
(a) Generation									
New Power Stations ^{1/}	84	446	106	65	69	71	5,162	3,274	0
Power Station Extension	1,260	0	456	4,555	456	0	0	0	0
Power Station Rehabilitation	195	161	253	380	542	747	1,336	1,680	1,292
Total Generation	1,539	607	815	5,000	1,067	818	6,498	4,954	1,292
(b) Other									
Transmission Lines	0	273	1,003	301	547	1,003	707	427	427
Substations	0	276	1,230	613	293	932	376	382	0
Dispatch Centers	13	29	41	54	65	56	66	76	88
General	11	50	57	84	91	22	61	59	57
Total Additions	1,563	1,235	3,146	6,052	2,063	2,831	7,708	5,898	1,864

^{1/} The new power stations in FY92, FY97, and FY98 are Damiotta Combined Cycle Power Plant, Kureimat Power Plant and Sidi Krir Power Plant respectively. Also included in power plant additions are several small isolated units.

2. The assumptions used to project working capital balances are summarized below:

Fiscal Year Ending June 30	Est'd		Projected						
	1991	1992	1993	1994	1995	1996	1997	1998	1999
No. of Months:									
Sales in Accounts Receivable	5.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Fuel Expenses in Accounts Payable	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
As a %									
Receivables to Sales	45.8%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Inventory to Gross Fixed Assets	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%
Consumer Deposits to Capex	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%
Other Payables to Capex	60.0%	37.7%	37.7%	37.7%	37.7%	37.7%	37.7%	37.7%	37.7%
Accruals to Operating Expense	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
% Increase in:									
Other Receivables	10.9%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%

The three months sales target for accounts receivable is expected to be achieved in FY92 on the basis of EEA action plan which consists of securing Government's agreement for settlement of outstandings of major public sector enterprises and close monitoring of payment of rescheduled arrears. EEA detailed action plan would consist of the following measures to be implemented on a continuous basis:

(a) implementation of EEA disconnection policies which require that supplies to consumers with balances outstanding for more than 30 days from date of submission of the bill should be discontinued until the balances and applicable re-connection fees have been paid;

(b) unified policy on charging interest on overdue accounts to be adopted;

(c) arrears to petroleum sector companies to be settled through periodic offsetting against balances owed by EEA to EGPC for fuel purchases; and

(d) EEA to seek agreements with its major customers for settlement of their accounts through a direct debit system in which EEA would submit its bills to customer banks for payment and possibly provide appropriate discount incentives for customers.

With implementation of these measures, EEA receivables are expected to be reduced to about 3 months sales revenue by the end of fiscal year 1992 according to the schedule shown below and to be maintained at levels not exceeding 3 months in all subsequent fiscal years.

Action Plan for Reducing Receivables to Three Months Sales

Proposed Targets (No. of Months Sales in Receivables)

Consumer Category	June 30 1991	Sept. 30 1991	Dec. 31 1991	Mar. 31 1992	June 30 1992
<u>VHV</u>					
Industrial	8.1	4.4	4.0	4.1	3.0
<u>HV</u>					
Industrial	4.7	2.8	2.3	2.6	2.6
Irrigation & Drainage	17.2	8.0	7.5	6.0	4.1
Land Reclamation	17.2	7.2	6.0	5.0	5.0
Dekhella Port	2.5	3.3	3.3	3.3	3.3
<u>MV</u>					
Industrial	5.9	3.3	3.2	3.2	3.1
Irrigation & Drainage	18.2	8.5	7.5	7.5	6.0
Salhia Projects	33.7	9.0	8.0	8.0	6.5
<u>EDCs</u>	4.8	4.5	4.4	3.8	3.0
Total EEA	5.6	5.1	4.9	3.8	3.0

EGYPT

KUREIMAT POWER PROJECT

Draft Terms of Reference

for Consultancy Services for Financial Management and Training

Introduction

1. The Egyptian Electricity Authority (EEA) is responsible for almost all the generation and transmission of electricity in Egypt. EEA sells the bulk of its electricity to eight distribution companies but also distributes some electricity directly to major industrial and agricultural consumers at 220-kV/132-kV, and 11-kV. For administrative purposes EEA is divided into seven zones plus the head office, each of which is a self-accounting unit with separately identifiable income and revenue expenditures; and assets and liabilities.
2. EEA has reasonably well-developed financial, cost and management accounting systems compared to utilities of similar size in developing countries. These systems have been developed as a result of several technical assistance efforts. A UNDP sponsored Power Sector Survey in 1976 first identified major deficiencies in EEA accounting and financial management systems. Under the First Power Project (Loan 1453-EGT) the Bank IDA provided 6 man-years of consultancy services to assist EEA improve its management information systems. This was followed up by further assistance under Loan 1733-EGT for consultancy services to modify EEA accounting and management information systems and coordinate them with those of the distribution companies. This task was continued by different consultants (NRECA, USA) under the Bank's Loan 1886-EGT, approved in 1980.
3. Further efforts were made under the UNDP Electricity Data Bank Project to improve EEA management information system, particularly through the introduction of computerization. However, because the Data Bank Project had as its primary focus collection of sector data in a systematic manner so as to facilitate planning and involved other agencies outside EEA, the emphasis placed on financial and cost accounting modules of the information systems was not adequate. As a result, only the cost accounting system was computerized under the Data Bank Project. However, this computerization was carried out without adequate prior analysis of the relevance of the manual systems and was not evenly implemented in the different zones. The financial accounting systems computerized with the help of a local contractor suffers from several design features and the extent of its implementation differs among the zones. As such EEA staff confidence in the system is low and hence they continue to rely on manual systems and thus inefficiently use resources through duplication. The inventory system remains uncomputerized and the value and variety of items involved makes efficient inventory management difficult. The

debt management module is being computerized by EEA staff as part of a Government-wide program to improve the effectiveness of debt management within the Government and the public sector.

4. Because of the remaining deficiencies in the financial and cost accounting systems, the production of quarterly management reports is always so behind schedule as to render the reports of little value. Similarly the production of financial statements is usually delayed, thus delaying the completion of year-end audits. Another major problem is the lack of analysis of the variances between actual and budgeted results in the management reports. This problem is principally because of the lack of relevant skills within EEA.

Objectives

5. The objective of the consultancy services are to assist EEA in: (i) carrying out a detailed analysis of the existing financial and cost accounting systems; (ii) modifying the systems design so as to enable them to form the basis for timely communication of relevant information to management, Government, lenders and other users; (iii) implementing the modified systems; (iv) providing on-the-job training to EEA staff in the head office and the zones; and (v) defining a specialized training program for a select group (2 from each zone plus 4 from head office) of EEA staff in cost analysis and management accounting and reporting. The specialized training program should include overseas visits to well-managed utilities for short durations.

Scope of Work

6. The scope of work should cover a review of the existing financial and cost accounting systems, recommendations and design of improved procedures for data processing and production of internal management reports and financial statements, implementation of recommendations, on-the-job training and design of a specialized training program for a select group of EEA staff.

7. Existing Financial and Cost Accounting Systems. The review should include an analysis of the weakness of these systems in the light of corporate objectives. Specifically, the review should examine the following major subsystems:

- general ledgers;
- sales and revenue accounting;
- procurement (purchasing);
- inventory procedures and materials management;
- the definition and appropriateness concepts of cost centers;
- fixed asset registers;
- payroll accounting.

The review should also examine the compatibility of the accounting and budgetary systems, the integration of financial and cost accounting subsystems, the system of monitoring and controlling project costs and

expenditures, the adequacy of internal control systems and the status of computer utilization and management information.

8. Recommendations and Design of Modified Systems. The consultant should produce his recommendations including systems documentation for the proposed modified system for discussion and agreement with EEA and the Bank prior to implementation.

9. Implementation. The consultants will be responsible for implementation of the modified system throughout EEA. The systems should be fully tested and completely de-bugged during the changeover period. On-the-job training should be conducted throughout all phases of the assignment including implementation. The consultant should provide adequate program documentation including all documentation necessary to facilitate system maintenance.

Outputs

10. The consultant should provide the following written reports:

- report on recommendations and proposed system design;
- computer programs documentation;
- report on proposed training program for specialized training of select group of EEA staff.

Estimated Manmonths

11. The estimated 67 manmonths would be utilized as follows:

- Review and analysis of existing financial and cost accounting systems and proposals for modified system 20 manmonths
- Implementation of modified system including on-the-job training 46 manmonths
- Preparation of a program for selected training of a select group of EEA staff 1 manmonth

EGYPT
Egyptian General Petroleum Corporation
Kureimat Power Project
Actual and Projected Balance Sheets

Fiscal Year Ending June	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
LE Million Unless Otherwise Stated										
<u>LONG-TERM ASSETS</u>										
Property, Plant & Equip. at Cost	1,528	1,830	2,005	2,273	2,889	3,996	5,308	6,780	8,378	10,073
Less Accum. Deprn.	<u>1,012</u>	<u>1,336</u>	<u>1,490</u>	<u>1,694</u>	<u>1,954</u>	<u>2,314</u>	<u>2,792</u>	<u>3,402</u>	<u>4,156</u>	<u>5,063</u>
	516	494	515	579	935	1,682	2,516	3,378	4,222	5,010
Work-in-Progress	<u>325</u>	<u>251</u>	<u>343</u>	<u>692</u>	<u>1,183</u>	<u>1,388</u>	<u>1,547</u>	<u>1,674</u>	<u>1,771</u>	<u>1,860</u>
Total Fixed Assets	841	745	858	1,271	2,118	3,070	4,063	5,052	5,993	6,870
Investments in Affiliates	2,925	3,135	3,135	3,135	3,135	3,135	3,135	3,135	3,135	3,135
Foreign Exchange Differences	-	-	186	551	923	1,003	1,019	974	900	822
Total L-T Assets	3,766	3,880	4,179	4,957	6,176	7,208	8,217	9,161	10,028	10,827
<u>CURRENT ASSETS</u>										
Net Cash	950	815	746	795	813	1,476	2,430	4,133	6,679	9,596
Other Current Assets	<u>1,100</u>	<u>1,200</u>	<u>1,890</u>	<u>2,538</u>	<u>3,524</u>	<u>5,056</u>	<u>6,090</u>	<u>7,020</u>	<u>8,000</u>	<u>8,567</u>
Total Current Assets	2,050	2,015	2,636	3,333	4,337	6,532	8,520	11,153	14,679	18,163
Current Liabilities	1,005	1,040	1,718	2,308	3,204	4,596	5,536	6,382	7,272	7,788
Net Working Capital	<u>1,045</u>	<u>975</u>	<u>918</u>	<u>1,025</u>	<u>1,133</u>	<u>1,936</u>	<u>2,984</u>	<u>4,771</u>	<u>7,407</u>	<u>10,375</u>
Total Assets 1/	<u>4,811</u>	<u>4,855</u>	<u>5,097</u>	<u>5,982</u>	<u>7,309</u>	<u>9,144</u>	<u>11,201</u>	<u>13,932</u>	<u>17,435</u>	<u>21,202</u>
<u>Financed As Follows:</u>										
Equity	300	300	300	300	300	300	300	300	300	300
Reserves	<u>4,118</u>	<u>4,187</u>	<u>4,381</u>	<u>4,994</u>	<u>6,025</u>	<u>7,845</u>	<u>10,030</u>	<u>12,960</u>	<u>16,700</u>	<u>20,719</u>
Total Equity	4,418	4,487	4,681	5,294	6,325	8,145	10,330	13,260	17,000	21,019
<u>L-T Debt</u>										
Foreign banks	268	239	309	593	900	929	814	626	401	163
Domestic Sources	<u>124</u>	<u>128</u>	<u>108</u>	<u>95</u>	<u>83</u>	<u>71</u>	<u>58</u>	<u>46</u>	<u>33</u>	<u>21</u>
Total L-T Debt	<u>392</u>	<u>367</u>	<u>417</u>	<u>688</u>	<u>983</u>	<u>1,000</u>	<u>872</u>	<u>672</u>	<u>434</u>	<u>184</u>
Total L-T Financing	<u>4,810</u>	<u>4,854</u>	<u>5,098</u>	<u>5,982</u>	<u>7,308</u>	<u>9,145</u>	<u>11,202</u>	<u>13,932</u>	<u>17,434</u>	<u>21,203</u>

1/ Total Assets may not exactly equal Total Financing due to rounding off differences.

EGYPT

Egyptian General Petroleum Corporation

Kureimat Power Project

Actual and Projected Statements of Sources and Application of Funds

Fiscal Year Ending June 30	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
LE Million Unless Otherwise Stated										
<u>Funds From Operations</u>										
Income Before Int. & Taxes	1,707	1,490	1,315	3,266	5,524	9,731	11,873	15,634	19,944	21,414
Add: Depreciation	<u>140</u>	<u>119</u>	<u>154</u>	<u>221</u>	<u>310</u>	<u>443</u>	<u>568</u>	<u>702</u>	<u>842</u>	<u>989</u>
Gross Internal Funds	1,847	1,609	1,469	3,487	5,834	10,174	12,241	16,336	20,786	22,402
<u>Less: Debt Service</u>										
Interest	25	23	20	48	70	72	69	57	43	28
Amortization	<u>42</u>	<u>41</u>	<u>56</u>	<u>111</u>	<u>180</u>	<u>211</u>	<u>234</u>	<u>246</u>	<u>251</u>	<u>253</u>
Net Internal Funds	<u>1,780</u>	<u>1,545</u>	<u>1,393</u>	<u>3,328</u>	<u>5,584</u>	<u>9,891</u>	<u>11,938</u>	<u>16,033</u>	<u>20,492</u>	<u>22,121</u>
<u>Other Sources</u>										
Foreign Debt Receipts	-	-	-	-	54	64	-	-	-	-
Local Debt Receipts	45	8	-	-	-	-	-	-	-	-
Equity	-	-	-	-	-	-	-	-	-	-
Total Other Sources	<u>45</u>	<u>8</u>	<u>0</u>	<u>0</u>	<u>54</u>	<u>64</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Sources ^{1/}	<u>1,825</u>	<u>1,553</u>	<u>1,393</u>	<u>3,328</u>	<u>5,638</u>	<u>9,955</u>	<u>11,938</u>	<u>16,033</u>	<u>20,492</u>	<u>22,121</u>
<u>Application of Funds</u>										
Taxes and Social Bank	395	333	321	768	1,327	2,378	2,865	3,858	4,939	5,311
Transfers to Govt.	1,033	864	780	1,838	3,095	5,460	6,554	8,789	11,221	12,057
Investment Expenditures	402	175	268	616	1,107	1,313	1,471	1,598	1,696	1,784
Incr. in Working Capital	(80)	64	13	59	90	139	94	85	89	52
Net Change in Cash	<u>75</u>	<u>117</u>	<u>12</u>	<u>48</u>	<u>18</u>	<u>664</u>	<u>954</u>	<u>1,703</u>	<u>2,546</u>	<u>2,917</u>
Total Applications	<u>1,825</u>	<u>1,553</u>	<u>1,394</u>	<u>3,329</u>	<u>5,637</u>	<u>9,954</u>	<u>11,938</u>	<u>16,033</u>	<u>20,491</u>	<u>22,121</u>
<u>Financial Ratios</u>										
Self-Financing	107%	162%	104%	108%	97%	146%	165%	207%	250%	263%
Rate of Return	50%	41%	34%	77%	115%	179%	187%	222%	255%	250%
Debt Service	27.7	25.2	19.2	22	23	36	40	54	71	80
Operating Margin	40%	33%	26%	43%	50%	57%	57%	62%	65%	65%
Current	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Current Assets/Sales	32%	33%	47%	38%	34%	31%	31%	29%	28%	28%
Current Liabilities/Exp.	40%	37%	50%	50%	50%	50%	50%	50%	50%	50%
Debt/(Debt+Equity)	8%	8%	8%	12%	13%	11%	8%	5%	2%	1%

^{1/} Total Sources may not exactly match total Applications due to rounding off differences.

EGYPT

KUREIMAT POWER PROJECT

Internal Rate of Return Analysis

1. The economic analysis was carried out on the basis of the time slice of EEA's Investment Plan for FY92-99 as reviewed by the mission. The proposed project forms an integral part of the investment plan and, therefore, it would not be convenient to separately calculate the Internal Economic Rate of Return (IERR) for the project. The IERR was calculated for the Base Case and sensitivity analysis was carried for four alternative cases. The Base Case gave an IERR of 10 percent. Basic assumptions for calculating the IERRs for the Base Case and the four alternatives are given in the following paragraphs.

2. Costs. All costs are based on July 1991 prices and calculated at an official exchange rate of LE 3.33 per US\$. The generation and transmission costs include taxes and physical contingencies but exclude price contingencies. Operation and maintenance costs (O & M) were estimated at 2 percent of cumulative costs for generation and 1.5 percent of cumulative costs for transmission. Fuel costs in (FY92) constant terms were used for IERR calculations and are based on the agreement reached with the Government under the SAL (para. 1.12 of the main report) and the Bank short- and long-term forecast (July 1991) for energy prices. The prices, in current and constant terms for fuel oil and diesel oil for FY92-99 are given below:

	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>
<u>Fuel Prices</u>								
A. In Current Terms								
1. Fuel Oil (LE/mt)	89	142	190	246	299	330	368	410
2. Diesel Oil (LE/mt)	320	511	686	886	1,076	1,188	1,325	1,477
B. In Constant Terms								
1. Fuel Oil (LE/mt)	89	98	115	136	156	165	175	185
2. Diesel Oil (LE/mt)	320	355	415	492	563	592	629	668

Note: The natural gas availability is expected to be supply-constrained for the medium and possibly long term (para. 1.12 of the main report). Therefore, the Government agreed to tie the price of natural gas supplied to the bulk consumers to the fuel oil equivalent.

3. Benefits. Measurable benefits include incremental electricity sales revenues for FY92-99 calculated by using the weighted average electricity price increases to reflect LRMC based tariffs by FY95 (para. 1.12 of the main report and Table B of Annex 2.3). The weighted average electricity tariffs in current and constant terms for FY92-99 are given below:

	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>
<u>Weighted Average Electricity Tariffs for EEA (mills/kWh)</u>								
A. In Current Terms	79.77	105.43	130.40	154.92	164.40	175.07	186.62	198.86
B. In Constant Terms	79.77	90.11	97.44	106.22	106.33	107.84	109.45	111.11

Beyond FY99, the tariffs are presumed to be constant in real terms till the life of the project. Non-measurable benefits to the economy not included in the analysis relate to benefits of the increased reliability of supply which is essential for the industry, the reduced cost of unserved energy and improved operational and managerial efficiency translating into better and efficient consumer service.

4. Sensitivity analysis. IERR was recalculated to determine the effect of: (i) an increase of 20 percent in the investment plan for generation (Alternative I); (ii) an increase of 20 percent in the investment plan for transmission lines and substations (Alternative II); (iii) a 20 percent reduction in revenue earnings (Alternative III); (iv) a 20 percent increase in fuel cost over the Base Case (Alternative IV). The results are given below:

Base Case	10.10 percent
Alternative I	8.16 percent
Alternative II	9.31 percent
Alternative III	4.78 percent
Alternative IV	8.21 percent

RATE OF RETURN ANALYSIS ON INVESTMENT
(in LE Thousand)

<u>Fiscal Year</u>	<u>Cost Streams</u>					<u><---Sales in GWh---><Benefit Stream></u>			
	<u>Generation</u>	<u>Transmission</u>	<u>O & M</u>	<u>Fuel</u>	<u>Total Cost</u>	<u>Total</u>	<u>Incremental</u>	<u>Revenues</u>	<u>Net Benefits</u>
FY92	945,898	219,901	22,216	47,192	1,235,207	41,715	2,282	182,035	(1,053,172)
FY93	1,059,123	550,423	51,655	107,114	1,768,315	44,046	4,613	417,984	(1,350,331)
FY94	1,807,622	888,003	101,127	187,440	2,984,192	46,309	6,876	669,997	(2,314,195)
FY95	1,929,732	782,040	151,452	306,600	3,169,824	48,738	9,305	988,377	(2,181,447)
FY96	1,625,913	716,116	194,712	450,808	2,987,549	51,287	11,854	1,260,436	(1,727,113)
FY97	1,802,243	686,526	241,055	541,978	3,271,802	53,525	14,092	1,519,681	(1,752,121)
FY98	1,611,074	530,881	281,240	691,627	3,114,822	56,265	16,832	1,842,767	(1,272,055)
FY99	1,157,470	375,821	310,027	843,060	2,686,378	58,725	19,292	2,143,341	(543,037)
FY2000			310,027	1,022,711	1,332,738	62,836	23,403	2,600,073	1,267,335
FY01			310,027	1,214,947	1,524,974	67,235	27,802	3,088,802	1,563,828
FY02			310,027	1,420,600	1,730,627	71,941	32,508	3,611,639	1,881,012
FY03			310,027	1,640,673	1,950,700	76,977	37,544	4,171,138	2,220,438
FY04			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY05			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY06			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY07			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY08			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY09			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY10			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY11			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY12			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY13			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY14			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY15			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590
FY16			310,027	1,876,128	2,186,155	82,365	42,932	4,769,745	2,583,590

Economic Rate of Return is 10.10%

Assumptions:

1. The oil prices are assumed to be steady in real terms from FY2000 onwards.

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EGYPT

KUREIMAT POWER PROJECT

Selected Documents and Data Available in the Project File

- A.1 1,200 MW Thermal Power Plant Engineering/Economic Feasibility Study for Kureimat, Phase I Report, December 1985, by Stone & Webster Inc. and its subcontractor ECG/CH²M Hill.
- A.2 1,200 MW Gas/Oil Thermal Power Plant Engineering/Economic Feasibility Study for El-Kureimat, Final Report, July 1989, by Stone & Webster Engineering Corporation and Engineering Consultants Group.
- A.3 Proposed Kureimat Power Project Environmental Assessment Report submitted by the Egyptian Electricity Authority and circulated to the Board on July 11, 1991.
- A.4 1,200 MW Gas/Oil Thermal Power Plant Environmental Assessment for El-Kureimat, Final Report, July 1991, by Stone & Webster Engineering Corporation and Engineering Consultants Group (Final Report and Volume II - Record of Inter-Agency/Form Meetings).

