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DEPARTMENT OF STATE  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
Washington, D.C. 20523

PROJECT PAPER

106 p.

Proposal and Recommendations  
For the Review of the  
Development Loan Committee

SYRIA - Rural Electrification

AID-DLC/P-2252

UNCLASSIFIED

DEPARTMENT OF STATE  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON D.C. 20523

UNCLASSIFIED  
AID-DLC/P-2252  
September 12, 1977

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: SYRIA - Rural Electrification

Attached for your review are recommendations for authorization of a loan to the Government of Syria ("Borrower") of not to exceed Thirty Four Million Seven Hundred Thousand Dollars (\$34,700,000) to assist in financing certain foreign exchange and local currency costs of goods and services required for the project. The loan is to finance the procurement of equipment and materials and engineering services for a nationwide rural electrification program.

No meeting is scheduled for this loan proposal. We would, however, appreciate your advising us of concurrences or objections as early as possible, but no later than the close of business on Wednesday, September 21, 1977. If you are a voting member, a poll sheet has been enclosed.

Development Loan Committee  
Office of Development  
Program Review

Attachments:

Summary and Recommendations  
Project Analysis  
Annexes:  
A - L

AGENCY FOR INTERNATIONAL DEVELOPMENT  
**PROJECT PAPER FACESHEET**

1. TRANSACTION CODE  
 A - ADD  
 C - CHANGE  
 D - DELETE

PP  
 DOCUMENT CODE  
 3

2. COUNTRY ENTITY  
 SYRIA

3. PROJECT NUMBER (7 digits)  
 [ 2760018 ]

4. BUREAU/OFFICE  
 A. SYMBOL [ NE ] B. CODE [ 4 ]

5. ESTIMATED FY OF PROJECT COMPLETION  
 , FY [ 82 ]

6. DOCUMENT REVISION NUMBER [ ]

7. PROJECT TITLE (Maximum 40 characters)  
 [ RURAL ELECTRIFICATION ]

8. ESTIMATED DATE OF OBLIGATION  
 A. INITIAL FY [ 77 ] B. QUARTER [ 4 ]  
 C. FINAL FY [ 77 ] (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$) -

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	34,700	-	34,700	34,700	-	34,700
(GRANT)	( )	( )	( )	( )	( )	( )
(LOAN)	( )	( )	( )	( )	( )	( )
OTHER 1	34,700	-	34,700	34,700	-	34,700
U.S. 2	( )	( )	( )	( )	( )	( )
HOST COUNTRY	-	62,000	62,000	-	62,000	62,000
OTHER (DONORS)	40,000	-	40,000	40,000	-	40,000
TOTALS	74,700	62,000	136,700	74,700	62,000	136,700

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH CODE		E. 1ST FY 77		H. 2ND FY 78		K. 3RD FY 79	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) SA	200	( )	252	( )	34,700	( )	( )	( )	( )
(2)	( )	( )	( )	( )	( )	( )	( )	( )	( )
(3)	( )	( )	( )	( )	( )	( )	( )	( )	( )
(4)	( )	( )	( )	( )	( )	( )	( )	( )	( )
TOTALS	( )	( )	( )	( )	34,700	( )	( )	( )	( )

12. IN-DEPTH EVALUATION SCHEDULED

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT	
	D. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN
(1)	( )	( )	( )	( )	( )	34,700
(2)	( )	( )	( )	( )	( )	( )
(3)	( )	( )	( )	( )	( )	( )
(4)	( )	( )	( )	( )	( )	( )
TOTALS	( )	( )	( )	( )	( )	34,700

MM YY  
 01 79

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

14. ORIGINATING OFFICE CLEARANCE  
 1 - NO  
 2 - YES

SIGNATURE: *Sally G. [unclear]*  
 TITLE: Director, NE/CD

DATE SIGNED: MM DD YY  
 01 03 77

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION  
 MM DD YY

AID 1330-4 (3-76)

AGENCY FOR INTERNATIONAL DEVELOPMENT  
**PROJECT IDENTIFICATION DOCUMENT FACESHEET**  
*To Be Completed By Originating Office*

1 TRANSACTION CODE  
 A - Add  
 C - Change  
 D - Delete

PID  
 2 DOCUMENT CODE  
 1

3 COUNTRY ENTITY  
 SYRIA

4 DOCUMENT REVISION NUMBER

5 PROJECT NUMBER (7 digits)  
 2760018

6 BUREAU/OFFICE  
 A Symbol NE B Code  4

7 PROJECT TITLE (maximum 40 characters)  
 RURAL ELECTRIFICATION

8 PROPOSED NEXT DOCUMENT  
 A  3  2 - PRP B DATE MM YY  9  7  7  
 1 - PP

10 ESTIMATED COSTS (\$000 or equivalent, \$1 = 1)

FUNDING SOURCE		AMOUNT	PERCENT OF TOTAL
a	AID Appropriated	34,700	25
b	OTHER	-	-
	US	-	-
c	Host Country	62,000	45
d	Other Donor(s)	40,000	30
TOTAL		136,700	100

9 ESTIMATED FY OF AUTHORIZATION/OBLIGATION  
 a INITIAL FY  7  7 b FINAL FY  7  7

11 PROPOSED BUDGET AID APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE		E. FIRST FY 77		LIFE OF PROJECT	
		D. Grant	D. Loan	F. Grant	G. Loan	H. Grant	I. Loan
(1) SA	200		252		34,700		34,700
(2)							
(3)							
(4)							
TOTAL					34,700		34,700

12 SECONDARY TECHNICAL CODES (maximum six codes of three positions each)

13 SPECIAL CONCERNS CODES (maximum six codes of four positions each)

14 SECONDARY PURPOSE CODE

15 PROJECT GOAL (maximum 240 characters)  
 Improve rural living conditions through provision of basic services, creation of new employment and income-earning possibilities, and means to increase agricultural production.

16 PROJECT PURPOSE (maximum 480 characters)  
 Make available dependable electric power to the population of the Project area at reasonable rates.

17 PLANNING RESOURCE REQUIREMENTS (staff/funds)  
 N/A

18 ORIGINATING OFFICE CLEARANCE  
 Signature: *[Handwritten Signature]*  
 Title: *[Handwritten Title]*  
 Date Signed: MM DD YY *[Handwritten Date]*

19. Date Document Received in AID/W, or for AID/W Documents, Date of Distribution  
 MM DD YY *[Handwritten Date]*

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PROJECT PAPER  
SYRIAN ARAB REPUBLIC  
RURAL ELECTRIFICATION PROJECT

1. SUMMARY AND RECOMMENDATIONS

A. Borrower

1.01 The Government of the Syrian Arab Republic (SARG), which will make the proceeds of the loan available to the Etablissement Public d'Electricite (EPE), the Syrian public utility responsible for the generation, distribution, and sale of electric power throughout the country.

B. The Loan

1.02 Not to exceed thirty-four million seven hundred thousand U.S. dollars (\$34,700,000) to finance the procurement of equipment and materials and engineering services. Procurement will be limited to United States source and origin (AID Geographic Code 000).

C. Loan Terms

1.03 Repayable in U.S. dollars over a period of forty (40) years, including a 10-year grace period for principal payments and interest at an annual rate of two percent (2%) during the grace period and of three percent (3%) thereafter.

D. Description of Project

1.04 In 1976, SOFRELEC (a French consulting firm) was contracted under the second IBRD-financed electric power generation loan to Syria (Mehardeh II loan, 1144-SYR) to carry out a feasibility study for a nationwide rural electrification program. The draft final report was submitted to SARG in May 1977. The report recommends a ten-year rural electrification program to provide electric power to approximately 4,000 villages. The program will be implemented in three consecutive phases based upon a gradual expansion of the rural electric system beginning with villages that have the highest relative economic return per unit of investment. The total cost in 1977 U.S. dollars will be approximately \$522 million.

1.05 The proposed AID loan in a parallel financing arrangement with the IBRD will contribute to the foreign exchange requirements of the first phase of the 10-year rural electrification program. Phase 1 (the Project) is an integrated power distribution system that will provide electric power to approximately 1,200 villages in 11 of Syria's 14 Mohafazats (districts) and will make power accessible to an estimated 900,000 people.

1.06 The IBRD will assist the Syrian Government in financing the foreign exchange costs of approximately 2,000 kms. of 20-KV medium tension line, 70 MVA of distribution transformers capacity, and related commodities. These Project components will link each village in the Project to the national central station (interconnected) power grid.

1.07 The AID loan will assist in financing the foreign exchange costs of approximately 3,000 kms. of 380-220 volt low tension intra-village distribution lines, street lighting and related materials. U.S. consulting engineering services required for the Project (an estimated 33 person-years) will also be financed by the loan.

1.08 The Government of the Syrian Arab Republic, acting through the Ministry of Power and the semi-autonomous Etablissement Public d'Electricite (EPE) will finance all in-country costs (e.g., local construction contracts, local currency portion of the engineering contract, transportation of materials, etc.) and any foreign exchange cost of goods and services not financed under the AID or IBRD loans.

1.09 The Project will deliver electric power (IBRD part) to at least 1,200 villages and distribute electricity (AID part) to approximately 50 percent of the households within those villages through initial connections to the system.

1.10 The total cost of the Phase 1 program is estimated to be \$136,700,000 as follows (in U.S. \$000):

	<u>FX</u>	<u>LC</u>	<u>TOTAL</u>
AID Loan	34,700	-	34,700
SARG	-	62,000	62,000
IBRD Loan	<u>40,000</u>	<u>-</u>	<u>40,000</u>
TOTAL	<u>74,700</u>	<u>62,000</u>	<u>136,700</u>

A detailed cost breakdown is contained in Section II and Annex B.

## E. Summary Findings

### 1. Technical Analysis

1.11 The feasibility study prepared by the French consulting firm SOFRELEC has been reviewed by AID and is judged to establish an adequate technical basis for Project components and cost estimates. Final design, specifications, cost estimates, procurement and construction supervision will be carried out by a U.S. engineering firm financed under the loan. The firm will review SOFRELEC's design recommendations for the low tension intra-village distribution systems and will recommend modifications as appropriate. The decision by SARG, IBRD and AID to use the AID-financed engineering consultant as the general consultant for the Project will ensure that the technical aspects of the AID-financed inputs and the inputs to be provided by IBRD and SARG vis-a-vis the Project are coordinated and compatible, and that equipment and material procurement will proceed smoothly and correctly.

1.12 The Project Committee believes that the above approach will result in a final Project design that will be technically sound and serviceable and be the most cost effective alternative.

### 2. Financial Analysis

1.13 Although EPE is similar to autonomous public utilities in other countries, SARG has determined that EPE will provide electric power to all villages in Syria with populations in excess of 100 over the next 10 years at user rates which reflect social rather than financial considerations. For that reason, it is not expected that EPE will be financially self-sufficient. Although positive steps have been and are being taken to make EPE function as efficiently as possible, short-falls in revenue from the sale of power at subsidized rates will continue to be financed by central government interest-free transfer payments. A covenant in the second IBRD power generation loan to Syria (Mehardeh II Thermal Power, 1144-SYR) requires EPE to adjust their rates to reflect the cost of power generation and distribution. It is expected that this issue will be raised during the negotiations for the anticipated IBRD loan to finance their portion of the Project. Therefore, some upward adjustment of the rate structure is anticipated by the IBRD.

3. Economic Analysis

1.14 The internal rate of return for the Project is approximately 8.9 percent. The IBRD estimates that the opportunity cost of capital in Syria is approximately 10 percent. Given the conservative basis of the rate of return analysis, the 8.9 percent rate of return is adequate to justify the Project.

4. Social Analysis

1.15 Experience in electrified areas in Syria as well as similar projects in other countries indicates that the Project will have a direct impact on the quality of life in villages and rural areas. House lighting, street lighting, the possibility for labor-saving household devices, refrigerators, and similar appliances will result in qualitative improvements in the lives of village people. In addition, the availability of reliable electric power may encourage the growth of local services, small industries, and contribute to increased agricultural production (e.g., substitution of lower cost and more reliable electric pumps for diesel pump irrigation).

1.16 No disruptive social or cultural changes are anticipated.

5. Environmental Considerations

1.17 On the basis of the Initial Environmental Examination prepared for the Project, the recommendation that a negative determination be made was approved by the Near East Bureau. The IEF and Negative Determination are attached as Annex A.

6. Statutory Checklist

1.18 All statutory criteria have been met.

7. AID's Funding Source

1.19 Security Supporting Assistance.

8. Mission's Views

1.20 The Embassy and USAID Mission strongly support this Project. The Mission Director's 611(e) Certification is attached as Annex I.

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9. Issues

1.1 None.

10. Recommendations

1.12 That a loan be authorized in an amount not to exceed U.S. \$34.7 million subject to the following terms and conditions:

(1) Conditions Precedent. In addition to the initial conditions precedent to the issuance of any commitment document or disbursement, the following conditions will be met by the Borrower in form and substance satisfactory to AID prior to the issuance of any specific commitment documents or disbursements.

(a) Initial Conditions Precedent

- (i) A signed contract with a U.S. consulting firm for engineering, construction supervision and consulting services; and
- (ii) A subsidiary agreement between Borrower and EPE to make proceeds from the loan available to EPE.

(b) For Equipment and Materials

- (i) A signed loan agreement between IBRD and the Government of the Syrian Arab Republic (SARG) or EPE to provide the foreign exchange to finance the medium tension and other integral elements of the Project and evidence that all conditions precedent to effectiveness of the IBRD loan have been satisfied;
- (ii) Evidence that all rights to install the electric power distribution network have been secured or are available to EPE as a public utility;
- (iii) Detailed time-phased implementation schedule (CPM, PERT or similar) for the Project;
- (iv) Evidence of the availability of adequate storage facilities for the commodities to be procured;
- (v) Evidence that construction services will be available as required to install the low tension distribution system.

(2) The loan shall be subject to such other terms and conditions as AID may deem advisable.

11. Project Committee

AID/W: Chairperson: Terrence J. Brown, NE/CD  
Economist: Leonard G. Rosenberg, NE/CD  
Engineer: Fred Lowell, SER/ENGR  
Counsel: Jan Miller, GC/NE  
Desk: Kurt Fehl, NE/JLS

USAID Damascus: Chairperson: Davy McCall  
CDO: Michael Kingery  
Procurement: W. Von Spiegelfeld  
Controller: William Miller

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## 11. PROJECT BACKGROUND AND DETAILED DESCRIPTION

### A. Background

#### 1. Economic Background

2.01 Syria is a predominantly agricultural economy heavily influenced by the public sector. More than half of its about 8.0 million people live in rural areas and many more make their livelihood directly or indirectly from agriculture. In 1976, approximately 20 percent of Syria's Gross Domestic Product (GDP) was generated in the agricultural sector, although this percentage is declining due to a relatively successful economic diversification program. The mining and manufacturing sector yields another 23 percent, while services (communication and transportation, trade and finance, public administration) produce nearly 50 percent. Almost all of industry, banking and wholesale trade, including foreign trade, have been nationalized. About one-quarter of Syria's cultivated land was expropriated during land reforms, but only two percent of Syria's cultivated land is owned by the State. The private sector still accounts for one-half of the GDP and should make an even greater contribution to the Syrian economy, especially in construction and services, as post-1970 liberalization policies become increasingly effective. Per capita GNP is estimated at approximately \$648 in current prices.

2.02 The country covers an area of 185,000 sq. km. The cultivable area is estimated at about 5.9 million hectares, or about 32 percent of the total land area. About 5.5 million hectares are actually cultivated with only about 3.7 million hectares under cultivation and the remaining hectarage fallow at any given time. Out of some two million hectares of irrigable land, a little over half a million hectares are now irrigated. It is estimated that the irrigated area could be doubled with the presently known water resources. The Euphrates River and its tributaries account for about 93 percent of the surface water flows. Because of the dominant role of agriculture, Syria's economic growth has been affected by variations in the quantity and timing of rainfall. Weather conditions are expected to be of declining importance in Syria's economic outlook as the Euphrates River Basin development brings some 600,000 new hectares under irrigation over the next 15-20 years. This will double Syria's irrigated land area. Coupled with Syria's efforts over the past decade to introduce improved techniques and diversify production, the expansion in irrigated land should make a substantial contribution to Syria's economic development.

2.03 Except for oil and phosphates, Syria's mineral resources are limited. Recently discovered phosphate deposits, although of low-grade, are estimated at over 200 million tons. Production of crude oil has grown rapidly. Proven reserves are estimated at about 300 million metric tons. In 1975, oil production was about 9.6 million metric tons; in 1976 about 10.5 million metric tons, and is expected to remain at about this level through 1980.

2.04 During the mid-1960s Syria went through a period of nationalization which extended government control over most non-agricultural production. Government fiscal and monetary policies were both expansionary and attempts were made to offset the resulting price increases through subsidies and controls. Having assumed ownership or control of the manufacturing sector, the Syrian Government attempted to negate market forces by fiat pricing. Rising input costs, price fluctuations, increasing defense outlays and a low tax base caused large, growing public sector deficits.

2.05 The resulting growth in aggregate demand was not reflected in domestic prices because of government intervention while the balance of payments was chronically negative, resulting in part from government purchases abroad, and in part from Syria's lack of emphasis on exports.

2.06 A policy of more flexible exchange rates in force since 1971 has resulted in a devaluation of about 10 percent and easing of import restrictions has led to a large increase in private sector imports. In the period of large foreign aid receipts (1973-75), particularly from Arab oil producers, government imports for development purposes have increased rapidly. The latter have, however, been disrupted in 1976 and 1977, causing a drawdown of reserves.

2.07 The SARG's third Five-Year Development Plan expired in December, 1975. A fourth Five-Year Plan was drafted, but subsequently withdrawn. This was caused mainly by changes necessitated by the fall in transfers from Arab oil producing states, and the costs of the war in Lebanon. Its appearance also was delayed by the change in government of August, 1976, as further changes were suggested by new appointees. The revised Plan, released in June, 1977, continues the third Five-Year Plan's emphasis on developing a balanced and diversified agricultural and industrial economy, with particular attention directed at the rural sector.

2.08 There has been a heavy migration of labor from rural areas to provincial capitals and Syria's major cities in search of higher incomes and better services than in rural areas. This exodus has been especially severe in the last three years as Syria's sharply increased development spending has created jobs mostly in urban areas. The migrants, as elsewhere, have included the most able-bodied of the workforce, leaving the farms short of labor. Seasonal migration to help out with peak demands for agricultural labor such as at harvest time has not solved the problem of scarce manpower in many rural areas. This has resulted in increased mechanization in areas where crops and land tenure permit, but has created severe difficulties in, for example, fruit-growing areas, and areas where small holdings predominate. The emigration from rural areas to the cities has also begun to strain urban services, so that, for example, considerable funds must now be invested in the Damascus and Aleppo water supply and sewer systems.

2.09 A comparison of rural and urban income levels is very difficult as there are significant differences in incomes between areas, and the cost of living and value of goods produced and consumed on the farm must be taken into account. However, some comparison of the availability of services can be made. According to the 1970 Housing Census 84 percent of urban dwellings were supplied with electricity, but only 10 percent of rural dwellings; 94 percent of urban houses had sewer facilities, but 11 percent of rural; 83 percent of urban dwellings had a piped water supply, as compared with 10 percent of the rural dwellings. Data on rural/urban distribution of education and health facilities is not available, but experience indicates that, similar to the other services mentioned, they are considerably less available, and of lower quality, than in urban areas. Finally, transport to and from rural areas is often poor because many roads are impassable in wet weather, making marketing and access to services provided in urban areas difficult.

2.10 The fourth Plan indicates that the investments required for rural services, such as electricity, will be very large. Preliminary plans for provision of water in rural areas call for expenditures of \$250 million in addition to the \$180 million anticipated for electrification before the end of 1980.

2.11 These investments, and others similarly important for Syria's development, cannot all be financed by the SARG. This is especially true following a reduction in other donor grants to Syria from a level of about \$510 million in 1974 and 1975, to about \$250 million in 1976. This reduction has caused an urgent need for foreign assistance and, in the rural sector, AID and other donors are increasingly active.

## 2. SARG Policy on Rural Electricity

### a. Development Program for the Electric Power Sector

2.12 Investment of S.L. 4.88 billion (\$1.25 billion) in the electric power sector was approved for the period 1976-1980 in the fourth Five-Year Plan. An additional S.L. 572 million (\$146 million) has been approved in the Reserve Plan; i.e., up to this amount of additional outlay has been approved by law and may be expended with the approval of the Prime Minister and the High Committee for Planning without any further referral to the Peoples' Council being required. These funds will be spent for the generation and transmission development of the inter-connected national power grid, for power distribution facilities, rural electrification, and miscellaneous programs such as the concrete factories, etc.

2.13 This investment is proposed to meet the following elements of new demand for electric power:

- (i) Increased demand for lighting for private housing and industry, which is growing at about 10-11% per year;
- (ii) Connection to the power grid of those areas and industries now supplied through isolated diesel generators;
- (iii) Expansion of rural electrification service;
- (iv) Supply of new large industrial units expected to come into production over the program period.

### b. Rural Electrification Program

2.14 The share of the rural electrification program in the approved 1976-1980 plan is S.L. 320 million (approximately \$82 million); to this must be added about \$160 million in the years 1979-1981 to finance the costs of the new 1977-1982 rural electrification program as formulated in the SOPRELEC feasibility study. Even with these additional funds, the rural electrification program is a relatively small part of the SARG's total program for electric power development - about 17 percent. However, it is significant in its potential social impact. [By improving rural living conditions, the SARG hopes to discourage excessive emigration from rural to urban areas. There are some 13,000 villages and farms in Syria, of which about 5,500 are villages with over 100 inhabitants; some 500 of which already have access to electric power. By the end of 1977, 150 more are to be connected to the power grid, of which 80 had been connected by mid-1977.] Under the proposed project, the first of three similar stages in EPE's Rural Electrification Program, central station rural electrification service would be provided to 1200 villages. The overall objective for rural electrification is to provide electricity to every village over 100 inhabitants by 1987.

### c. Access to Electricity

2.15 Of the total population of eight million, some 4.5 million (56%) have access to electricity. Those supplied from EPE's inter-connected system or isolated captive plants are overwhelmingly in urban areas, while the approximately 3.5 million who at present have no access to electricity are mainly in about 3,000 villages having 2,000 inhabitants or less (two-thirds of which constitute villages of 500 inhabitants or less).

## 3. Foreign Assistance to the Electrical Sector

### a. The World Bank (IBRD)

2.16 The IBRD's first loan for the electrical sector, No. 986-SYR, was made to EPE in 1974. The loan amount was originally \$25 million for the purchase and installation of a 125 MW unit for the Mehardeh Thermal Power Project. In 1975 the Bank added \$8.6 million to the Loan 986-SYR to cover the costs of raising the thermal unit's capacity from 125 MW to 150 MW. At the same time the Bank

made a second loan of \$72 million (Loan 1144-SYR) for the purchase and installation of a second 150 MW unit at Mehardeh, construction of six 230 KV sub-stations located at Deir-es-Zor, Soueida, Hassakeh, Lattakia, Meskene, and Adraa as well as extension of two existing 230 KV sub-stations at Damascus and Meskene, construction of a new head office building in Damascus, and engineering and consultant services and training.

2.17 Several studies were financed under these two loans, including a management study by Arthur Young Co., a U.S. consultant, a rate study by Electricity of England, a feasibility and development study for rural electrification, by the French engineering firm SOFRELEC, a study of long-term energy requirements for the EPE system and industrial plants connected with it; feasibility studies on the availability and utilization of gas for power generation and other purposes; and the interconnection of EPE's system with those of contiguous countries.

2.18 The training component of the second loan also provided for the purchase and installation of equipment for a training school for upper level technicians, including power plant operators, and engineering, operating and administrative staff. The training school has started with technical assistance from Electricite de France.

2.19 Terms for Loan 986-SYR are a 7.25 percent interest rate, with a repayment period of 25 years including a grace period of three and one-half (3½) years. Terms for the supplement to Loan 986-SYR and 1144 SYR are an 8.5 percent interest rate with a repayment period of 25 years including a three (3) year grace period.

b. Other

2.20 EPE has also received the following loans from various bilateral sources:

- (i) The Kuwait Fund for Arab Economic Development participated in financing for the first stage of the Mehardeh Project in 1975 with a loan of \$33 million equivalent. The interest rate was four percent (4%), and the repayment period was 19 years including three and one-half (3½) years of grace.
- (ii) The Abu Dhabi Fund lent 51.5 million Dirhams in 1974 for a dispatch system for operating the extensive 230 kV system and generating facilities. This loan was made at four percent (4%) interest for 19 years with three (3) years of grace.
- (iii) The German Democratic Republic (GDR) has lent about \$150 million equivalent for the power sector since 1969, of this \$100 million signed in 1976 and 1977 is for rural electrification. Earlier loans were for development of the 66 kV and 20 kV networks including sub-stations, with the balance to be paid over a 12-year period, including a grace period for all equipment delivered under the loan plus two (2) years. The interest rate is two and one-half percent (2½%).
- (iv) In 1965 France extended a five-year commercial credit of \$7 million for the 230 kV transmission line from Aleppo to Damascus and three sub-stations.

Additional financing for EPE is expected from the recent French-Syrian Protocol, but the amount has not yet been decided.

- (v) In 1974, the Arab States donated 10 gas turbines.

c. Commingling

2.21 As indicated in paragraph 2.20 above, the German Democratic Republic has provided assistance to EPE. On March 4, 1977, the Assistant Administrator, Near East Bureau, determined that the proposed Project does not promote or assist bloc projects or activities under the terms of Section 620 (H) of the Foreign Assistance Act, as amended. Although the amount of the proposed loan was then estimated at \$18 million, the Determination remains effective. The Action Memorandum is attached as Annex L.

B. Project Description

1. Sector Goal

2.22 The sector goal of the Project is to improve rural living conditions through the provision of basic services, creation of new sources of employment and income-earning possibilities, and enhancing agricultural production. The following indicators will be used to measure attainment of the sector goal:

- a. Average real family incomes in the Project area will increase.
- b. Project area residents will realize incomes from jobs that did not exist before electricity became available.
- c. The population of the Project area will have ready access to services not available prior to the Project.
- d. The population of electrically powered farm machinery and equipment in the Project area will increase.

2. Project Purpose

2.23 The purpose of the Project is to make reliable electric power available to the population of the Project area at reasonable rates. The following indicators will be used to verify achievement of the Project purpose:

- a. Electric power will be available 24 hours a day to the population of villages in the Project area.
- b. Approximately 50 percent of the households in the Project area will be connected to the power network; and
- c. All connected households will have electric light and a majority will have at least one electric appliance.

2.24 EPE records, data from the Syrian Central Bureau of Statistics, and studies which will be undertaken by the AID-financed consulting firm as part of the final Project evaluation will be used to verify attainment of the above.

2.25 The assumptions which link the Project purpose with the sector goal are that available electric power will encourage small-scale industry to become established in the Project area and that the absence of reliable power is an inhibiting factor in the allocation of public and private sector resources in the Project area.

### 3. Project Outputs

2.26 Project outputs are as follows:

- a. Installation of low-voltage (380/220 volt) intra-village power distribution systems in approximately 1200 villages;
- b. Installation of street lighting in approximately 1200 villages;
- c. Construction of approximately 2000 kms. of 20-kV medium tension distribution line; and
- d. Approximately 70 MVA of distribution transformer capacity installed.

2.27 The assumptions linking project outputs to the purpose area as follows:

- a. The EPE transmission and distribution system will be capably managed and maintained. (See Section A.)
- b. Electric power will be available to meet the demand of the Project network. (See Annex B.)
- c. Households will have sufficient disposable income to make use of the electricity made available by the Project. (See Annexes B and C.)
- d. All high and medium tension power distribution lines and sub-stations will be available when necessary. (See Annex B.)

#### 4. Project Inputs

2.28 Project inputs will include all necessary conductor, insulators, transformers, meters, support poles, luminaries, and other material to connect approximately 75,000 households in 1200 villages to the national central station power network. In addition, engineering services to prepare the final design of the Project and supervise construction will be provided. See Section III and Annex B for a detailed breakdown of Project Inputs.

2.29 The Project's Logical Framework Matrix is shown in Annex F.

### III. PROJECT ANALYSIS

#### A. Technical Analysis

##### 1. Background

3.01 In 1976, SOFRELEC (a French consulting firm) was contracted under the second IBRD-financed electric power generation loan to Syria (Mehardeh II Loan, 1144-SYR) to carry out a feasibility study for a nationwide rural electrification program. The draft final report was submitted to SARG in May, 1977. The report recommends a ten-year rural electrification program to provide electric power to approximately 4,000 villages. The program will be implemented in three consecutive phases based upon a gradual expansion of the rural electric system beginning with villages that have the highest relative economic return per unit of investment. The total cost in 1977 U.S. dollars will be approximately \$522 million.

3.02 The Project consists of the first phase of the SOFRELEC 10-year program and will provide over a four-year period central station electrical power to at least 1,200 villages with a total population of approximately 900,000 inhabitants. The Project will be financed with assistance from IBRD and AID under a parallel financing arrangement. After a review of the draft feasibility report, SARG/EPE, IBRD, and AID agreed that the Project would be divided into IBRD and AID-financed segments on the basis of system voltage (medium vs. low tension) rather than by regions of the country. The IBRD loan will finance the foreign exchange cost of approximately 2,000 kms of 20 kV medium-tension lines, 70 MVA of distribution transformer capacity, and some elements of the low-tension system. The proposed AID loan will finance approximately 3,000 kms. of 380-220 volt low-tension lines and related material and an estimated 33-person years of consulting engineering services.

The details of the Project's technical analysis are included in Annex B. A brief summary of the conclusions of the technical analysis is given below:

2. Summary Conclusions:a. Power Generation:

3.03 Total existing generating facilities and planned or under construction will be more than adequate to supply power to meet the demand created by the Project.

b. Transmission Lines:

3.04 The high voltage transmission lines and 66/20-kv substations to provide central station power to the Project are in place or under construction.

c. Project Cost Estimates:

3.05 The following is a summary of the anticipated costs of the Project:

ITEM	PROJECT SUMMARY FINANCIAL PLAN					
	(in US \$000)					
	AID FX	IBRD FX	SARG LC	FX	LC	TOTAL FX-LC
20 kV (medium-tension distribution lines)	-	9,300	5,000	9,300	5,000	14,300
Distribution Transformers, 20/0.4 kV	-	3,800	800	3,800	800	4,600
380-220 volt secondaries (low-tension)	21,000	14,600	29,200	35,600	29,200	64,800
Engineering	3,300	-	1,300	3,300	1,300	4,600
Physical Contingency <sup>1/</sup>	2,430	2,770	3,630	5,200	3,630	8,830
Price Contingency <sup>2/</sup>	7,970	9,030	22,100	17,000	22,100	39,100
TOTAL	<u>34,700</u>	<u>39,500</u>	<u>62,000</u>	<u>74,200</u>	<u>62,000</u>	<u>136,200</u>

<sup>1/</sup> 10% Physical Contingency

<sup>2/</sup> 30% Foreign exchange and 35% local currency price contingency.

Detailed cost and quantity estimates are contained in Annex B.

#### d. Consulting Engineering Services

3.06 The AID loan will finance the U.S. dollar cost of the engineering consulting contract for the Project. During joint discussions in Damascus attended by EPE, IBRD, and AID, it was agreed that one consultant contractor would be used for services covering the total project, including the final design of the medium-tension and low-tension distribution systems. This decision reflects the determination of the parties to ensure appropriate coordination in design and construction. Of particular importance during the design review phase is the study of SOFRELEC's low-tension distribution design recommendations. It is possible that some reduction in per-village costs can be realized if a one-phase system is utilized in some villages rather than the three-phase system recommended by SOFRELEC. If another alternative is defined by the AID consultant and is acceptable to EPE and IBRD, it is anticipated that more than the projected 1200 villages can be electrified by the Project. A summary scope-of-work is included in Annex B.

#### 3. Environmental Considerations

3.07 On the basis of the initial environmental examination, a negative determination was proposed and approved by the Near East Bureau. A copy of the IEE and negative determination is included as Annex A.

### B. Financial Analysis

#### 1. General

3.08 Although EPE is similar to autonomous public utilities in other countries, SARG has determined that EPE will provide electric power to all villages in Syria with populations in excess of 100 over the next 10 years at user rates which reflect social rather than financial considerations. For that reason, it is not expected that EPE will be financially self-sufficient. Although positive steps have been and are being taken to make EPE function as efficiently as possible, short-falls in revenue from the sale of power at subsidized rates will continue to be financed by central government transfer payments. A covenant in the second IBRD power generation loan to Syria (Mehardeh II Thermal Power 114-SYR) requires EPE to adjust their rates to reflect the cost of power generation and distribution. It is expected that this issue

will be raised during the negotiations for the anticipated IBRD loan to finance their portion of the Project. Specifically, EPE has agreed previously to raise their tariffs by an amount sufficient to generate a rate of return on fixed assets in operation of nine percent beginning in 1978. This would require a rate increase on the order of 30 percent. Although IBRD and EPE may agree to modify this requirement, some increase in tariffs is expected. It should be emphasized that even without the increase in the level of electric power rates to achieve the 9.0 percent return on average net fixed assets, EPE is a financially viable utility. The net operating revenue would still be adequate to meet all recurring costs of the system, including operations, maintenance and administration, and debt service obligations. It would substantially reduce EPE's contribution to their 1977-1982 capital investment expansion program from the LS 1,382.2 million noted in the table below (Financing Plans and Funds Statement, 1977-1982 Program) to only LS 520.3 million (from 22 percent to nine percent of total capital investment requirements) and require additional funds from non-EPE sources.

3.09 See Annex D for the detailed financial analysis.

## 2. Repayment Prospects

3.10 Balance of payments data for Syria are incomplete. Military imports and some foreign financing may be omitted or disguised. However, the data that are available show a deteriorating balance of trade through 1976, which is a reversal of the improving balance of payments shown in 1973-75. Reserves have fallen significantly during the last year for reasons given below.

3.11 Foreign exchange reserves increased steadily after 1970, principally due to large foreign currency transfers, and significant private capital inflows in 1971. The 1973-75 increase, approximately \$800 million, resulted from higher oil and cotton prices, but, more importantly, vastly higher receipts from Arab oil producers. In 1975, reserves equalled over 40 percent of that year's imports.

3.12 In 1976, in spite of oil and cotton price increases most other elements entering the balance of payments decreased. Exports, principally oil and cotton, increased about \$100 million, while imports increased about \$300 million. There also was a major decrease of about \$100 million in petroleum transit fees. Services accounts, such as tourism, also ran large deficits, and workers' remittances declined, so that the goods and services account deficit was \$950 million compared to \$580 million in 1975. In 1975 the deficit was offset by transfers from Arab oil producers, however, this has not been the case in 1976. The best estimate of such receipts is \$225 million.

3.13 SARG Ministry of Finance records of external public debt, excluding that of less than one-year maturity or related to national defense, show a rapid increase between 1970 and 1975, from \$253.4 million to \$453.0 million (75%). Debt repayments have increased from \$33.0 million in 1970 to \$59.6 million in 1974, and \$104.0 million in 1975. About \$133 million is believed to have been due in 1976. Repayments are believed to be about \$250 million in 1977, and to remain at about that level until 1981, based on debts already contracted, i.e., excluding payments on any new debts incurred. Since Syrian exports are not expected to rise significantly during this period, and as additional debt will most likely be contracted, the debt service ratio will probably increase. Given the sharp increase in external debt and AID's interest in supporting Syria's development efforts, AID's normal concessional loan terms are proposed: 40 years maturity including two percent (2%) interest during a ten-year grace period and three percent (3%) thereafter.

3.14 As indicated above, long-term growth prospects are good, however, and the repayment prospects for the loan appear reasonable.

### C. Economic Analysis

3.15 On the basis of information provided by SOFRELEC and IBRD, the rate of return for the Project is approximately 8.9 percent. Benefits are measured primarily in terms of revenue from the sale of electricity to households and small commercial enterprises. Capital investments and operations, maintenance and administration comprise the Project's economic costs. Although IBRD estimates that the opportunity cost of capital in Syria is 10 percent, the conservative measure of Project benefits as discussed in Annex C indicates that the Project is economically justified.

3.16 The detailed economic analysis is included in Annex C.

D. Social Analysis

3.17 The primary project benefit will be an improvement in the quality of life in villages, both directly for those individuals living in homes that are electrified and indirectly through public street lighting, improved storage of perishables at local stores, social services, community television receivers, and similar items of public consumption. These benefits are largely non-quantifiable except in terms of payment for electricity used.

3.18 In other countries, rural electrification programs have resulted in improvements in village water supplies (through the installation of electric pumps), better health services (improved lighting and refrigeration in rural clinics), and increased access and use of educational facilities (lighting in classrooms). It is assumed that similar changes will occur as a result of the proposed Project. Most villages to be electrified by the Project are relatively close to urban centers and therefore changes introduced by improved access to electric power are not expected to result in significant and measurable changes in the cultural environment.

3.19 Availability of reliable electric power may encourage growth of rural employment through the expansion of small-scale industry. Other income-related changes such as increased agricultural production due to the introduction of electricity on farms may also occur overtime. These changes, however, are dependent on a number of other factors outside the framework of the Project. For that reason, income-related changes are goal-level rather than purpose-level indicators of project success and are not considered significant modifications in the socio-economic environment which can be directly attributed to the Project.

3.20 The detailed Social Analysis is contained in Annex E.

#### IV. ADMINISTRATIVE ARRANGEMENTS

##### A. Implementing Agency - EPE

###### 1. Background

4.01 The executing agency for the loan will be the Etablissement Public d'Electricite (EPE), the SARG organization with operational responsibility for generation, transmission and distribution of electric power in Syria. EPE is the direct descendant of five private electric power companies, formerly owned by French and Belgian interests, which generated and sold electric power in Syria's major cities during the French Mandate. In 1951 these companies were nationalized and the operation of the electrical system was brought under the general supervision of the Ministry of Public Works.

4.02 Fourteen years later in 1975, EPE was created, and some 21 locally-owned private power companies supplying smaller towns and villages were also nationalized. All regional power facilities became branches of the newly established EPE, which was given exclusive responsibility under Decree No. 8, 1965 to generate, transmit and sell electric power in Syria. EPE can authorize other organizations to generate electricity in appropriate circumstances, but any excess power generated is to be supplied to EPE.

###### 2. Present Organizational Structure

4.03 EPE's general responsibilities and policies, including approval of EPE's budget, investment plans, tariffs, foreign loans, foreign contracts and tenders, etc., are determined by the General Director and the Board of Directors. The General Director is appointed by the Prime Minister; the present General Director is Mr. Rifaat Idriss, an electrical engineer. The Board of Directors is appointed by the Minister of Electricity and includes the Directors of Finance, Generation, Planning, Administration, the Southern Region, and one representative of the Workers Union, to which all employees of EPE belong.

4.04 As presently organized, EPE's staff has 19 directorates, all of which report directly to the General Director; 13 of the directorates have functional responsibilities, and six have regional responsibilities.

4.05 In March 1977 EPE had 11,600 employees, projected to increase to 13,000 by the end of 1977. Of these 635 were in

EPE headquarters. EPE's staff is well supplied with professional specialists; 314 electrical and mechanical engineering graduates, and 184 graduates in law, finance, etc. The staff also includes 477 middle level technicians--i.e., those who have their baccalaureates but have not completed university training. The balance consists of skilled workers (technical high school graduates) and unskilled labor.

### 3. Regional Organization

4.06 EPE has six regional directorates which are responsible for maintenance and operation of the medium and low tension systems, as well as direction of new works, for reading and maintaining electric meters and sending out bills to subscribers to the system. Under each of these directorates are four or five district offices; in addition, towns or villages where diesel generators are located may also have EPE offices. The major share of EPE's regional staff is in the Southern Region (Damascus, Kuneitra, Der'aa and Soueida--2,889 people), the Central Region (Homs and Hama--2,987 people), and the Northern Region (Aleppo and Raqqa--2,051 people). The remainder are distributed between the Coastal Region (Tartous and Lattakia--884 people), the Eastern Region (Deir es Zor--303 people), and the Northeastern Region (Hassake--365 people).

### 4. Tariffs

4.07 EPE's tariff rates are shown in Annex K. For domestic and commercial lighting, there are two that apply throughout Syria, those areas connected to the EPE grid--19 piasters per kwh, and one for areas not connected with the grid, which is slightly higher.

4.08 For smaller industrial and commercial consumers, there are block kwh rates, and time-of-day kwh rates for the larger industrial connections.

4.09 With the objective of unifying and modernizing the tariff structure, EPE hired Electricity of England as consultants to make a tariff study, which was financed under the World Bank's Second Loan for the Mehardeh Power Project. The consultants have prepared a draft report, but following consultation with EPE and the Bank, are making revisions in their study.

4.10 In the Second Mehardeh Loan Agreement, EPE agreed with the Bank to adjust its tariffs to provide sufficient revenues to yield from January 1, 1978 an annual rate of return on fixed assets in use of not less than 9 percent. To achieve this, EPE will have to increase its rates; the Bank intends

to raise this with SARG in connection with its proposed loan for rural electrification.

#### 5. Planning

4.11 EPE generally prepares broad outlines of facilities to be executed, which are then--in the case of major facilities--studied by consultants with respect to technical requirements. EPE's plans are then worked out with the Ministry of Electricity, which represents the electricity sector in the SARG planning process.

#### 6. Effectiveness of EPE Management

4.12 The World Bank has gathered detailed knowledge over the last four years of EPE's operations, gained through the Bank's two loans for the Mehardeh Thermal Power Project and the preparation of the Bank's proposed loan to EPE for a rural electrification project. The Bank's recent supervision mission determined that EPE's technical operations were satisfactory and that its record justified further Bank lending. However, EPE's accounting and financial management need improvement. Under the Bank's loan for the Second Mehardeh Thermal Power Project, a management study of EPE's organization was to be undertaken by an American firm, Arthur Young. EPE initialled a contract with Arthur Young in Feb., 1977 for implementation of their accounting recommendations. This contract has now been referred for approval to the High Economic Committee in the Prime Minister's Office, whose approval is expected by late summer 1977. In line with the Young report's recommendations, EPE plans to appoint a director for management who will report directly to the General Director. With implementation of the Young report, the administration of both the Ministry and EPE is expected to improve, although the basic division of responsibility for the electrical sector between them is not expected to be changed.

4.13 The feasibility study for rural electrification by the French consultant, SOFRELEC, recommends further organizational changes in EPE's organization to improve its capacity to execute the rural electrification program. Whether or not these will be accepted in toto is uncertain, but in any case EPE proposes to establish a separate directorate for rural electrification, plans for which are currently being considered but have not yet been approved. It is expected that the staff of this Directorate will include a central office in EPE headquarters, and also regional offices that will report to EPE headquarters through the existing regional directorates, but also will have a direct relationship with the functional directorates in EPE headquarters.

## B. Ministry of Electricity

### 1. Background

4.14 The Ministry of Electricity in its present form is a relatively recent addition to the SARG organization for generation and distribution of electric power. EPE was in complete charge of the electricity sector until the creation of the Ministry for Petroleum and Electricity was organized in 1969, when it was administratively attached to the Ministry, although retaining its operating independence.

4.15 When a separate Ministry of Electricity was created in 1974 it assumed supervisory responsibility for EPE. The Ministry's principal function is to represent the electrical sector in the SARG planning process and in formulation of general policies for the electrical sector. Once the Plan has been approved by law, e.g., the Peoples' Council has approved it and the President has issued the appropriate decree, EPE is responsible for its implementation. In the case of other policy decisions requiring approval of the President or Peoples' Council, such as changes in rates, etc., these, too, are referred by EPE to the Minister of Electricity and to the Prime Minister. The Ministry's staff numbers only about 50 people, most of whom serve as advisors to the Minister.

### 2. Construction and Installation

4.16 The Ministry of Electricity has considered the organization of its own construction companies to build electrical facilities, and a decree to establish such companies has been sent to the Prime Minister. However, the Ministry and EPE have decided not to implement this proposal at this time. EPE expects to use local independent contracting firms for construction and installation of about 80 percent of the facilities in the project; the remaining 20 percent would be carried out by EPE's own resources. Several Syrian public contracting enterprises and private contractors have already had considerable experience in construction of electric facilities. Construction would be under the general supervision of the regional directorates. EPE maintains a central store of materials, however, from which the construction companies would obtain the materials needed to carry out the contracts.

4.17 The Ministry and EPE have also considered the establishment of their own factories to produce electrical parts which are now largely imported, and for which EPE has a continuing need. EPE is already manufacturing concrete electric power poles in a factory near Aleppo and a second factory is under construction in Deir-es-Zor. Other local manufacturing facilities being considered would produce insulators, transformers, switches, fuses, parts of steel transmission towers, etc. This plan is not being pursued at present, however, probably because as new projects these factories have a relatively low priority in SARG's investment priorities. SARG is now concentrating available financing on the completion of projects already started.

C. Consulting Engineering Firm

4.18 As discussed in Section III, A, above, the engineering firm contracted for the Project will perform critical management functions during implementation, including the coordination of procurement, inventory control of commodities, project accounting, coordination of construction activities, and preparation of a detailed schedule (PERT, CPM or similar) for the Project.

4.19 In carrying out these activities, it is expected that a transfer of U.S. technology, E.G., management skills, will occur. To foster this technical assistance aspect of the work of the consultant, the contract will provide for participation by employees of EPE in the consultant's management team.

D. A.I.D.

1. USAID Monitoring

4.20 Primary responsibility for monitoring the Project will fall within the Capital Development Office, which has engineering personnel assigned. Other important inputs will be made by the USAID Procurement Specialist and the Controller. The Mission will review procurement proposals, plans, specifications, and contract documents for commodity procurements, assist in the preparation of procurement documents for engineering services,

and undertake periodic site visits. The review and approval of procurement documents will require periodic TDY assistance from SER/ENGR and GC/NE. Approval of specific documents and procedures will be made by the Mission with the participation of AID/W consistent with the Mission's Delegation of Authority.

4.21 Monthly reports will be submitted by the engineering consultant on the progress of the Project. No unusual monitoring problems are anticipated.

## 2. Disbursement Procedures

4.22 A four-year disbursement period is planned. Procurement of goods and services will be under host country contracting procedures following AID procurement guidelines (AID Handbook 11). The U.S. engineering firm to be contracted under the proposed loan will assist EPE in the preparation of commodity equipment documents, bid analyses, and contracting and will assure that these procedures are implemented in conformity with AID guidelines.

## E. Implementation Plan

### 1. Loan Schedule

Loan Authorization	15 Sept. 1977
Loan Signed, Implementation Letter No. 1 Issued	30 Sept. 1977
Initial CPs Met	30 June 1978
Equipment CPs Met	31 Jan. 1979
Project Activity Completion Date	30 Dec. 1981

## 2. Project Schedule

4.24 The complexity of coordinating the design, procurement, and construction elements of the Project require that a detailed PERT or similar time-phased event network be developed and utilized.

4.25 As indicated in Section III, A, the engineering firm to be contracted under the proposed loan will be responsible for the development of this management system. When completed, the PERT will supersede the preliminary implementation schedule outlined below:

- Publication of Notice for A & E Expressions of Interest	1 Oct. 1977
- Short List Approved by SARG and AID	15 Dec. 1977
- Technical Proposals Submitted	31 Jan. 1977
- Ranking of Firms Approved by SARG and AID	15 Mar. 1978
- A & E Contract Executed	30 May 1978
- NTP Issued	30 Jun. 1978
- Consultant Design Review and Recommendations with PERT Submitted	30 Sept. 1978
- IFB for Equipment and Materials Issued	28 Feb. 1979
- IFB for Civil Works Issued	31 Mar. 1979
- Award Equipment Contracts	31 May 1979
- Award Civil Work Contracts	30 Jun. 1979
- Initial Equipment Deliveries	31 Oct. 1979
- Construction Completed	30 Dec. 1981

F. Evaluation Plan

4.26 The Project will be evaluated annually at the output level. Reports submitted by the consulting engineering firm on a monthly basis and those submitted by EPE on a quarterly basis will provide sufficient information to permit output-level project monitoring by AID. These reports will be supplemented by site visits by USAID personnel. It is anticipated that a joint meeting attended by EPE, AID, IBRD, and the engineering firm will be held at least annually for the purpose of reviewing the status of the implementation of the Project.

4.27 Upon completion, the Project will be evaluated at the purpose level. The engineering consultant will be requested to include in his final report sufficient information to verify most of the measures of project purpose achievement. It is not anticipated that the Project will be evaluated at the goal level. EPE will be requested to provide whatever additional information necessary to complete the evaluation of purpose achievement as part of their final report to be submitted to AID. In addition to the AID evaluation, it is expected that IBRD will prepare an end-of-project report on their loan which will include the Project.

G. Conditions, Covenants, and Negotiating Status

1. Conditions Precedent

(a) Conditions Precedent to Initial Disbursement

4.28 In addition to the submission of the standard legal certifications, Borrower will be required to submit an executed consulting engineering contract acceptable to AID and an acceptable subsidiary agreement with EPE that will make available to EPE the proceeds of the AID loan.

(i) Consulting Engineering Contract

4.29 The engineering firm contracted under the proposed AID loan will undertake a complete review of the SOFRELEC preliminary design and prepare equipment bidding documents as a result of that review including possible design modifications. Since these services are crucial to the implementation of the construction phase of the Project, it is recommended that an executed engineering contract be included as an initial condition precedent.

(ii) EPE subsidiary Agreement.

4.30 The AID loan will be made to the government of the Syrian Arab Republic who in turn must make the funds available to EPE. Under the terms of the pass-through agreement between SARG and the Damascus Water Authority, Etablissement Public des Eau de Figeih (EPEF), AID loans 276-J-008 and 276-K-10, SARG made available the loan funds as a direct capital contribution to EPEF.

A similar capital grant pass-through mechanism is anticipated in the case of EPE

Since this is normal Syrian procedure and in light of the precedent set by the SARG/EPEF Agreement, pass-through of the AID loan to EPE under a two-step loan mechanism would be an extremely difficult negotiating point. Therefore, it is recommended that the loan authorization permit use of a capital contribution pass-through mechanism.

(b) Conditions Precedent to Disbursement for Equipment and Materials:

4.31 The following CPs are recommended in addition to the submission of executed contracts for commodities acceptable to AID:

## (i) SARG - IBRD Loan Agreement:

4.32 The AID-IBRD parallel financing arrangement for financing the foreign exchange requirements of the Project makes it essential that the IBRD loan agreement for the Project be executed and all conditions precedent to its effectiveness met prior to disbursement of AID loan funds for equipment and materials. IBRD anticipates that their agreement will be signed in early CY 1978.

## (ii) Power Distribution Rights of Way:

4.33 Borrower will be requested to submit evidence that it has acquired or has the authority to acquire all necessary rights of way for the construction of the distribution lines for the Project.

## (iii) Detailed Implementation Schedule:

4.34 The coordination of procurement and construction is sufficiently complex to require evidence of Borrower's plan to manage the Project as well as provide a mechanism for adequate Project management. Borrower will also be requested to submit a revised financial plan for the Project as part of the detailed schedule. Since it is anticipated that the consulting engineering firm will be required to prepare a PERT-type activity/event network, this CP should be fulfilled without difficulty.

## (iv) Storage Capacity:

4.35 The majority of AID-financed commodities for the Project will be delivered relatively early in the Project and will require in-country warehousing prior to their issuance to construction companies. Evidence that EPE will have sufficient and adequate storage available for these commodities is considered a reasonable and necessary condition.

## (v) Construction Services:

4.36 It is not anticipated that the AID Loan will finance construction services. Although international tendering of construction is possible under the IBRD Loan, most if not all of the construction will be handled by Syrian contractors (public or private sector) including some force account. Borrower will be requested therefore to furnish evidence that construction services will be available on a timely basis. Evidence could take the form of construction IFBs in process, signed contracts or other administrative arrangements, adequate funds budgeted, etc.

2. Other Conditions

4.36 The IBRD loan agreement may contain covenants regarding the performance of EPE such as a specific minimum rate of return on fixed capital assets in use. Although it is not anticipated that EPE would default under that or any condition or covenant of the IBRD agreement, suspension of disbursement under the IBRD loan for any default would endanger the Project. To protect AID's interests under the proposed loan, it is recommended that the Standard Provisions Annex of the AID loan agreement concerning Borrower default (Article D: Termination; Remedies) be modified to include default under the IBRD loan agreement as an event of default under the AID loan agreement.

ANNEXES

to

Project Paper

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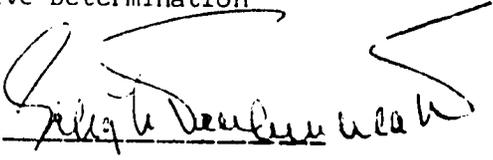
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Threshold Decision Based

on

Initial Environmental Examination

PROJECT LOCATION: Syria  
PROJECT TITLE: Rural Electrification  
FUNDING: FY 1977 - \$34.7 million  
LIFE OF PROJECT: Four (4) years  
IEE PREPARED BY: Terrence J. Brown, NE/CD Date: 8/31/77  
ENVIRONMENTAL ACTION RECOMMENDED: Negative Determination  
BUREAU FOR NEAR EAST DECISION:

APPROVED:   
\_\_\_\_\_

DISAPPROVED: \_\_\_\_\_

DATE: 9/1/77

Clearances:

GC/NE: JMiller(Draft) Date: 8/17/77

SER/ENGR: FLowell(Draft) Date: 8/18/77

Initial Environmental Examination

Narrative Discussion

1. PROJECT LOCATION: Syria
2. PROJECT TITLE: Rural Electrification
3. FUNDING: FY 1977 - \$34.7 Million
4. LIFE OF PROJECT: Four (4) Years
5. IEE PREPARED BY: Terrence J. Brown, NE/CD Date: August 31, 1977
6. ACTION RECOMMENDED: Negative Determination
7. DISCUSSION OF MAJOR ENVIRONMENTAL RELATIONSHIPS OF PROJECT  
RELEVANT TO ATTACHED IMPACT IDENTIFICATION AND EVALUATION FORM:

The AID loan will be used to finance a portion of the foreign exchange cost of the first phase of the Syrian Rural Electrification program (the Project). The Project will provide central station electric power to approximately 1,200 villages with a population of about 900,000 people at an estimated total cost of \$136.7 million. Specifically, the AID loan will finance the U.S. dollar cost of engineering design and supervision services for the program and equipment and materials for the installation of the low tension distribution component of the electrification program. A loan from IBRD will assist SARG with the construction of the medium tension network (\$40.0 million). Power will be provided from the Syrian national central station power system. The Government of the Syrian Arab Republic (SARG) will provide the local currency necessary for the construction of the low tension network, including electric power poles, street lamps, transformers, house connections and meters (\$62.0 million).

No significant environmental impact is anticipated during the construction phase of the Project. Based on existing knowledge of the Project areas, neither the IBRD-financed medium tension nor the AID-financed low tension distribution systems will require extensive tree-cutting or land-clearing activities. The countryside in Project areas is semi-arid with negligible tree cover and wildlife.

In addition, the scope of work for the U.S. engineering firm to be contracted under the AID loan will specify that environmental factors will be taken into account in the final engineering design for the construction of the Project.

It should be noted that no generating facilities are to be constructed under the Project or will be required specifically as a result of the Project. Existing central station generating capacity and high tension transmission and new capacity currently under construction will be sufficient to meet total central station power demand in Syria into the late 1980's. Expanded generating capacity includes the recently completed Euphrates Dam with five 100 MW turbines now on-line and three to be on-line by 1978.

Regarding the socio-economic impact, the primary project benefit will be an improvement in the quality of life in villages, both directly for those individuals living in homes that are electrified and indirectly through public street lighting, improved storage of perishables at local stores, social services, community television receivers, and similar items of public consumption. It is estimated that initial consumption will be approximately 300-350 kwh per household per year. Project demand projections are based upon residential and small commercial use only. In other countries, rural electrification programs have resulted in improvements in village water supplies (through the installation of electric pumps), better health services (improved lighting and refrigeration of medical supplies in rural clinics), and increased access and use of educational facilities (lighting in classrooms). Similar changes are likely to occur in Syria as a result of the proposed Project.

Most villages to be electrified in Phase I are relatively close to urban centers, and therefore changes introduced by improved access to electric power are not expected to result in significant and measurable changes in the socio-economic environment.

Availability of reliable electric power may encourage growth of rural employment through the expansion of small scale industry. Other income-related changes such as increased agricultural production due to the introduction of electricity on farms may also occur over time. These changes, however, are dependent on a number of other factors outside the framework of the Project. Therefore, Project justification does not rely upon the sale of power to large industrial users or the expansion of irrigated agriculture. For that reason, income-related changes are goal-level rather than purpose-level indicators of project success and are not considered significant modifications in the socio-economic environment which can be attributed to the Project.

On the basis of the above discussion and the attached Impact Identification and Evaluation Form, no significant environmental impact is deemed likely and, therefore, a Negative Determination is recommended.

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact  
Identification  
and  
Evaluation 2/

Impact Areas and Sub-areas 1/

A. LAND USE

- |  |       |
|--|-------|
| 1. Changing the character of the land through: |       |
| a. Increasing the population -----             | N     |
| b. Extracting natural resources -----          | N     |
| c. Land clearing -----                         | L     |
| d. Changing soil character -----               | N     |
| 2. Altering natural defenses -----             | N     |
| 3. Foreclosing important uses -----            | N     |
| 4. Jeopardizing man or his works -----         | N     |
| 5. Other factors                               |       |
| _____  | _____ |
| _____  | _____ |

B. WATER QUALITY

- |   |       |
|---|-------|
| 1. Physical state of water -----        | N     |
| 2. Chemical and biological states ----- | N     |
| 3. Ecological balance -----             | N     |
| 4. Other factors                        |       |
| _____                                   | _____ |
| _____                                   | _____ |

1/ See Explanatory Notes for this form.

2/ Use the following symbols: N - No environmental impact  
L - Little environmental impact  
M - Moderate environmental impact  
H - High environmental impact  
U - Unknown environmental impact

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IMPACT IDENTIFICATION AND EVALUATION FORM

C. ATMOSPHERIC

- 1. Air additives ----- N
  - 2. Air pollution ----- N
  - 3. Noise pollution -----
  - 4. Other factors
- \_\_\_\_\_
- \_\_\_\_\_

D. NATURAL RESOURCES

- 1. Diversion, altered use of water ----- N
  - 2. Irreversible, inefficient commitments ----- N
  - 3. Other factors
- \_\_\_\_\_
- \_\_\_\_\_

E. CULTURAL

- 1. Altering physical symbols ----- N
  - 2. Dilution of cultural traditions ----- L
  - 3. Other factors
- \_\_\_\_\_
- \_\_\_\_\_

F. SOCIOECONOMIC

- 1. Changes in economic/employment patterns ----- M
  - 2. Changes in population ----- L
  - 3. Changes in cultural patterns ----- L
  - 4. Other factors
- \_\_\_\_\_
- \_\_\_\_\_

IMPACT IDENTIFICATION AND EVALUATION FORM

3

G. HEALTH

- 1. Changing a natural environment ----- N -----
- 2. Eliminating an ecosystem element ----- N -----
- 3. Other factors
- \_\_\_\_\_
- \_\_\_\_\_

H. GENERAL

- 1. International impacts ----- N -----
- 2. Controversial impacts ----- N -----
- 3. Larger program impacts ----- N -----
- 4. Other factors
- \_\_\_\_\_
- \_\_\_\_\_

I. OTHER POSSIBLE IMPACTS (not listed above)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

See attached Discussion of Impacts.

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UNIVERSITY OF ALABAMA

TECHNICAL ANALYSIS

Considered in this section are the aspects of the Project relating to existing and projected power supply and demand for EPE's central station (inter-connected) system, transmission capacity, and detailed project description and cost estimates.

1. Generating Capacity

Since its establishment in 1965, EPE has continually expanded Syria's generating and transmission system. In 1972, total installed plant capacity was approximately 230 MW. During the Middle East war in 1973, a total capacity of 150 MW was damaged. The short-term impact of the war was severe but not prolonged, thanks to purchases of power from Lebanon, delivery of a number of gas turbines ordered before the war, and delivery of 10 gas turbines which were donated by various Arab states. By the end of 1976, EPE's total installed generating capacity was 949 MW (effective capacity 860 MW, of which 832 MW was central station plant capacity). The dramatic increase in capacity was due primarily to initiation of power generation at the Euphrates Dam hydroelectric station at Thawra. The station began operation with three 100 MW units in 1974, had five 100 MW units in operation in 1976, with all eight 100 MW units scheduled to come on line by the end of 1977 or early 1978. By the end of 1977 total central station plant capacity will be 1,272 MW, including 735 MW from hydroelectric generation, 164 MW steam, 60 MW diesel and 316 MW gas turbines. Firm capacity for the inter-connected system in 1977 will be an estimated 1,062 MW (plant capacity minus the two largest hydro units and largest steam unit). By 1982, total central station plant capacity will be 1,960 MW. The increase in capacity will result from the completion of large thermal plants at Mehardeh, financed by IBRD (300 MW scheduled to come on line in 1978 and 1979), and Baniyas, financed by West Germany (300 MW scheduled to come on-line in 1981 and 1982). In addition, 57 MW of existing gas turbine capacity is scheduled for connection to the central station system in 1978. Total firm capacity in 1982 will be 1,638 MW.

Tables 1 and 2 show detailed power sector generation projections.

The demand for power is expected to increase sharply in the period 1977 to 1982, particularly public sector heavy industry. Total required net generation is expected to increase from 2,184 GWH in 1977 (including power losses) to 5,632 GWH in 1982. Total available net generation will increase from 3,042 GWH in 1977 to

5,912 GWH by 1982. Government heavy industry is projected to increase over the period 1977 to 1982 from 900 GWH to 2,479 GWH, representing approximately 50 percent of total demand by 1982 (excluding power losses). The rural electric program will demand some 100 GWH by 1982, or approximately 2 percent of total demand.

The estimated total available net generation in 1977 is 3,042 GWH, which will increase to 5,912 GWH by 1982. As indicated in Table 3, on the basis of firm energy projections, the margin of supply over demand will be 280 GWH, or 5 percent of required net generation.

It should be noted that the power demand of government heavy industry is based upon full implementation of SARG industrialization plans. Any reduction in the scope of industrialization will serve to increase the margin of available net generation over demand.

On the basis of the estimates of firm energy availabilities in excess of demand to at least 1982, and the small share in total demand occupied by the rural electrification program, adequate power will be available to supply the requirements of the Project.

## 2. Transmission

EPE's transmission networks comprise about 1144 kms. of 230 KV lines, some 1260 kms. of 66 KV lines, about 4,000 kms. of 20 KV lines and some 9,500 kms. of low voltage distribution lines. Nearly all the rated distribution voltage in the country has been changed from 127/220 to 220/380 three phase, four wire, 50 Hz. Some of the towns are still on 127/220, but the whole country will be on 220/380 by 1980.

With the assistance of external financing, including the Soviet Union and East Germany, EPE has expanded its high voltage transmission capacity (230 KV and 66 KV). The World Bank and East Germany have assisted in the construction of additional 230/66 KV sub-stations (IBRD) and 66/20KV sub-stations (East Germany). The IBRD rural electrification appraisal mission reviewed the transmission and sub-station requirements for the project and concluded that adequate transmission capacity is in place and the necessary 66/20 KV sub-stations in place, under construction, or scheduled for construction with equipment on order. On the basis of that judgment, it is concluded that power will be available from the central station system for the Project. This judgment will be verified by the U.S. consulting engineer to be contracted under the loan prior to the issuance of bid documents for equipment and materials.

### 3. The Project

The Project consists of providing central station electric power to approximately 1,200 villages over a four-year period. The Project will include the following:

- construction of approximately 2,000 kms. of 20 KV line, including poles, cable, insulators, etc.
- construction of approximately 3,000 kms. of 380/220 volt low tension distribution line, including poles, cables, insulators, service drops, house meters, etc.
- street lighting for approximately 1,200 villages
- 20/0.4 KV distribution transformers
- 33 person-years of consulting engineering services.

The SOFRELEC draft feasibility study established the design parameters for the Project, including equipment specifications, quantity, and cost estimates. The draft report was reviewed in Damascus by an IBRD appraisal mission in May-June 1977. The report was discussed in detail with EPE and representatives of SOFRELEC. Certain modifications were made in the design, including substitution of aluminum for copper conductor and the use of imported wood support poles rather than locally-produced cement poles for approximately 50 percent of projected pole requirements. However, most of the design features of the SOFRELEC report were retained by the IBRD appraisal mission for their analysis. The following is a description of the Project elements and costs as derived from the IBRD appraisal mission's preliminary project analysis for the Project, including that portion to be financed under the proposed AID loan. Following this description, the AID portion of the Project will be examined.

#### a. 20 KV Medium Tension Distribution Network

The 20 KV power distribution network will connect individual villages to the high tension national central station power grid at appropriately located 66/20 KV sub-stations. The medium tension network will consist of approximately 630 kms. of 120 sq. mm. ACSR conductor and 1,455 kms. of 50 sq. mm. ACSR conductor, for a total network of approximately 2,085 kms. The 20 KV network will provide power to individual village distribution transformers.

The total estimated cost (unescalated) is \$14.3 million, of which \$9.3 million is foreign exchange and \$5.0 million local cost (see Table 4). IBRD intends to finance the foreign exchange costs of this Project component.

b. Distribution Transformers

Each village will be served by at least one distribution transformer to supply 380/220 volt power to the village. Approximately 70 MVA of distribution transformer capacity will be required for the 1,200 villages in the Project ranging from 25 KVA to 400 KVA. It is not anticipated that transformers will be installed to serve small, isolated loads such as individual farms during the Project.

The total estimated cost (unescalated) of distribution transformers is \$4.6 million, of which \$3.8 million is foreign exchange and \$0.8 million local cost (see Table 4). The IBRD intends to finance the foreign exchange cost of this Project component.

c. 380/220 Volt Low Tension Distribution Network

The low tension network will serve individual villages and provide consumers access to 50 hz, 3-phase electric service on a 24-hour per day basis. Initially, individual households will be provided single-phase service. The low tension network will consist of the construction of approximately 2,910 kms. of conductor, of which 2,000 kms. will be 50 sq. mm. AA bare conductor and 910 kms. of 25 sq. mm. AA bare conductor. The Project will also supply all necessary conductor and other material to connect approximately 75,000 households (50 percent of the household in the Project villages) to the low tension village systems, including service drops and meters.

In addition, street lighting will be installed in all villages served by the low tension system (approximately 20 street lights per km.).

The estimated total cost (unescalated) of the system is \$64.8 million--\$35.6 million foreign exchange and \$29.2 million local costs (see Table 4). IBRD has allocated most of the foreign exchange financing of this program component to AID, including the conductor, insulators, related hardware, and street lighting. The IBRD would finance imported wood support poles, hardware, and indirect foreign exchange costs.

d. Engineering

One engineering consulting firm will be contracted to provide engineering services for the Project. IBRD estimates that approximately 33 person-years of service will be required for a total estimated cost (unescalated) of \$4.6 million -- \$3.3 million foreign exchange and \$1.3 million local costs (see Table 4). The foreign exchange costs of the contract would be financed by AID.

e. Local Materials and Construction

(1) Support Poles: IBRD estimates that approximately 131,400 support poles will be necessary to complete the Project (20,800 for the medium tension and 110,600 for the low tension networks). According to the Appraisal Mission, current EPE concrete pole production capacity is approximately 60,000 poles per year. EPE plans to expand that capacity to 120,000 poles per year by 1981. Although IBRD estimates that EPE could supply all the poles needed for the Project, the Appraisal Mission recommends that approximately 50 percent of the poles be imported wood support poles.

Their recommendation is based upon the reduced erection time and cost of wood poles, ease of transport over rough terrain, and observed use of wood poles in Syria for both high and low tension distribution lines. EPE estimates that costs of the two types of poles are essentially equal; therefore, use of wood support poles will not increase Project costs.

(2) Meters: The IBRD Appraisal Mission states that EPE will supply meters for all consumer connections during the Project. Meters are included, therefore, as part of the indirect foreign exchange cost element of the low tension distribution system.

(3) Construction: It is anticipated that all construction under the Project will be handled by Syrian public and private contractors (70-80 percent) and EPE force account (20-30 percent).

Individual house connections (service drops and meters) will be installed by EPE.

SOFRELEC evaluated Syrian construction capacity and found that sufficient capacity will be available for the Program. The IBRD Appraisal Mission supports this determination.

4. AID Project

The proposed AID loan will consist of the construction of the low tension village distribution systems and the provision of engineering services for the Project. Although the draft SOFRELEC feasibility report and preliminary information made available by the IBRD Appraisal Mission establishes an adequate technical basis for the Project, including quantity and cost estimates for commodities to be procured under the AID loan, the SOFRELEC design is a relatively high cost approach to rural electrification. In recognition of this issue, AID and IBRD have agreed that the U.S. engineering firm contracted under the AID loan will undertake a detailed review of the SOFRELEC design and recommend alternatives

as appropriate to reduce the cost of the overall system without reducing Project benefits.

Following is a detailed description of the AID Project based upon the existing design, a review of some of the issues involved in the existing design, an outline scope of work for the engineering consultant, and a summary financial plan for the AID Project.

a. Detailed Description and Cost Estimates

The basic components of the low tension village distribution system are outlined under paragraph 3.c. above. The preliminary IBRD quantity and cost estimates are contained in Table 5. These were reviewed by AID and an alternative list of equipment to be financed under the AID loan was prepared by AID Engineering to test the sensitivity of IBRD cost estimates to changes in material specifications. Identical total quantities were used where specified by the IBRD estimates.

In the case of conductors, AID assumed No. 2 AWG bare conductor would be used for 90 percent of the low tension system and 10 percent would be insulated quadplex cable. The total average cost per kilometer is \$315. IBRD used a combination of 12.5, 25 and 50 sq. mm. bare conductor for a total average cost of \$305. Table 4 reflects the higher per kilometer cost.

For service drops, IBRD estimated that each drop would be \$75. AID Engineering estimated the service drops would be \$56 assuming an average length per drop of 20 feet. IBRD believes the length of the drops may exceed 20 feet. Therefore, Table 4 reflects the higher IBRD costs.

For street lighting, AID estimates exceed IBRD's by \$10 per luminary. The AID estimate was retained for Table 4.

The line item including insulators, clips, and all other hardware is derived from the total kilometers of line to be constructed. Given IBRD's experience with EPE and SOFRELEC, their estimated cost for all hardware was incorporated in Table 4.

The total cost of the AID-financed component of the Project is \$34,700,000, including 10 percent physical contingency and 30 percent total price contingency. The contingency estimates represent IBRD's analysis of anticipated price changes.

The quantity and cost estimates contained in Table 4 represent the most accurate estimate available using the SOFRELEC preliminary design. Modifications which may be made in the design by the U.S. engineering firm may alter both the quantity and type of equipment and material specified. It is anticipated that some cost savings

can be realized as a result of design modifications. These cost reductions will make it possible to increase the number of villages in the Project, thereby expanding benefits without increasing costs.

b. Engineering Services

The AID loan will finance the U.S. dollar cost of the engineering consulting service contract for the Project. During joint discussions in Damascus attended by EPE, IBRD and USAID, it was agreed that a single consultant would be used for services covering the Project, including the medium tension and low tension distribution systems. This not only will reduce the complexity of contract management by EPE, but will ensure appropriate coordinated design and construction functions, smooth the construction consummable procurement process for both IBRD and AID, and by virtue of the fact that it will be a U.S. firm, give good visibility to the AID assistance effort on behalf of the SARG. The contract will be a host-country contract, and include the following:

(1) Design Review & Bid Preparation

(a) Review the low tension distribution design, and recommend cost effective alternatives, if any.

(b) Recommend a final list of villages to be electrified during the Project.

(c) Based on (a) and (b) above, prepare final system design and complete equipment and materials take-off and cost estimates.

(d) Prepare detailed implementation schedule for the Project.

(e) Review completed and planned high tension distribution system (230 KV lines, 230/66 KV substations, 66 KV transmission and 66/20 KV substations) to verify technical adequacy and availability for providing power to the Project.

(f) Prepare equipment and material IFB's for the Project (IBRD and AID financed), assist EPE in the bid evaluation of supplier bids, and recommend award to EPE.

(g) Advise EPE on preparation of construction contract IFB's for the Project, assist EPE in the analysis and verification of bids, and recommend awards.

(2) Construction Management & Supervision

(a) Assist EPE in identification of suitable storage space for imported construction consummables.

(b) Establish and implement an inventory control system for equipment and materials receipt, storage, and issuance to construction contractors.

(c) Establish a Project accounting system compatible with EPE's overall accounting system to be installed by the Management Consultant.

(d) Supervise construction of Project works. Of particular importance during the design review stage is the study of SOFRELEC's low tension distribution design recommendations. It is possible that some significant reduction in per-village costs can be realized if a single-phase system is utilized in some villages rather than the three-phase system recommended by SOFRELEC. If another alternative is defined by the AID-financed consultant and is acceptable to EPE and IBRD, it is possible that more than the projected 1,200 villages could be electrified by the Project.

Table 1

## SYRIA RURAL ELECTRIFICATION

## Power Generating Plant, Existing and Planned (MW)

	Nameplate Capacity (MW)	Installation Year	Effective Capacity (MW)							
			1977	1978	1979	1980	1981	1982	1983	1984
<b>HEADQUARTERS PUBLIC ELECTRICITY</b>										
<b>(a) Hydro Stations</b>										
Amara	8 x 100 = 800	1974-1977	720 <sup>1/</sup>	720	720	720	720	720	720	720
Souk Wadi Barada	2 x 3.5 = 7	1955	7	7	7	7	7	7	7	7
Rasran	2 x 4 = 8	1971	8	8	8	8	8	8	8	8
<b>Total Hydro</b>			<u>735</u>	<u>735</u>	<u>735</u>	<u>735</u>	<u>735</u>	<u>735</u>	<u>735</u>	<u>735</u>
<b>(b) Steam Stations</b>										
... (Damascus)	2 x 15 = 30	1977	28	28	28	28	28	28	28	28
Hama ( " )	1 x 5.7 = 5.7	1977	5	5	5	5	5	5	5	5
Ain Tall (Aleppo)	1 x 13.75 = 13.75	1973	13	13	13	13	13	13	13	13
Ain Tall ( " )	2 x 6.25 = 12.5	1957	11	11	11	11	11	11	11	11
... (Homs)	2 x 15 = 30	1977	26	26	26	26	26	26	26	26
Kassabeh ( " )	3 x 30 = 90	1977	81	81	81	81	81	81	81	81
Kassabeh ( " )	1 x 64 = 64	1978	-	60	60	60	60	60	60	60
Mahardeh (Homs)	2 x 150 = 300	1973-1979	-	142	284	284	284	284	284	284
Baniyas	2 x 150 = 300	1931-1982	-	-	-	-	142	284	284	284
Plant "x"	2 x 150 = 300	1983	-	-	-	-	-	-	-	-
Plant "y"	2 x 150 = 300	1985-1986	-	-	-	-	-	-	142	284
<b>Total Steam</b>			<u>164</u>	<u>366</u>	<u>508</u>	<u>508</u>	<u>650</u>	<u>732</u>	<u>920</u>	<u>1,065</u>
<b>(c) Gas Turbine Stations</b>										
Damascus	2 x 19.75 = 37.5	1977	29	29	29	29	29	29	29	29
Spadich	1 x 23 = 23	1977	18	18	18	18	18	18	18	18
Hama ( " )	1 x 10.5 = 10.5	1977	10	10	10	10	10	10	10	10
Aleppo	3 x 20 = 60	1974	54	54	54	54	54	54	54	54
Latakia	2 x 20 = 40	1974	36	36	36	36	36	36	36	36
Hama	3 x 20 = 60	1975	54	54	54	54	54	54	54	54
Hama	1 x 10.5 = 10.5	1975	10	10	10	10	10	10	10	10
Homs	4 x 20 = 80	1975	72	72	72	72	72	72	72	72
Damascus	5 x 20 = 100	1974-1975	90	90	90	90	90	90	90	90
<b>Total Gas Turbine</b>			<u>373</u> <sup>2/</sup>	<u>373</u>						
<b>Total Sector</b>			<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>
<b>(d) Industrial Plants (Co-generation)</b>										
Electric Refinery	4 x 12.5 = 50		net total available to the interconnected system.							
Sugar Industries	8 x 3 = 24		50	50	50	50	50	50	50	50
Paper Industries	1 x 10.5 = 10.5									
Fertilizer plants										
<b>Total Co-generation</b>			<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>
<b>Total Sector</b>			<u>1,332</u>	<u>1,584</u>	<u>1,726</u>	<u>1,726</u>	<u>1,868</u>	<u>2,010</u>	<u>2,141</u>	<u>2,293</u>

TABLE 1

(Annex B)  
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TABLE 2

## SYRIA RURAL ELECTRIFICATION

Balance of Energy and Power, 1976-1982

	1976	1977	1978	1979	1980	1981	1982
<u>Interconnected System</u>							
Sales, GWh							
Domestic & Commercial	500	550	599	675	764	848	940
Private (Light) Industry	350	400	428	473	523	579	640
Government (Heavy) Industry	394	900	1,015	1,522	1,838	2,108	2,479
Government Services 1/ )							
Railways & Streetlighting )							
National Oil Companies )							
Irrigation	15	28	78	150	196	306	600
Rural Electrification	-	-	10	20	40	70	100
	<u>1,259</u>	<u>1,878</u>	<u>2,130</u>	<u>2,840</u>	<u>3,361</u>	<u>3,911</u>	<u>4,759</u>
Losses, GWh	210	205	451	582	604	745	873
Required Net Generation, GWh	1,459	2,184	2,581	3,422	4,025	4,656	5,632
of which:							
Hydro	1,229	1,697	2,290	2,290	2,290	2,290	2,290
Steam	140	328	259	950	1,224	1,826	2,484
Diesel	9	-	-	-	-	-	4
Gas Turbine	91	182	-	-	37	202	327
Purchases	-	-	32	182	307	232	232
Peak Demand, MW	327	400	441	587	690	806	965
Load Factor, %	51%	60%	67%	67%	67%	66%	67%
<u>Plant Capacity, MW 2/</u>							
Hydro	465	735	735	735	735	735	735
Steam	24	164	366	508	508	650	792
Diesel	27	60	60	60	60	60	60
Gas Turbine	316	316	373	373	373	373	373
Total Capacity MW	<u>832</u>	<u>1,272</u>	<u>1,534</u>	<u>1,676</u>	<u>1,676</u>	<u>1,818</u>	<u>1,960</u>
<u>Reserve, MW</u>							
2 largest hydro units 2x90	180	180	180	180	180	180	180
plus largest steam unit	30	30	142	142	142	142	142
Firm Capacity, MW	622	1,062	1,212	1,354	1,354	1,496	1,638
Capacity Margin, MW	265	662	771	767	664	690	673
<u>Isolated Systems</u>							
Sales, GWh							
Domestic & Commercial	49	40	42	40	32	29	27
Industrial	42	25	30	25	22	20	18
	<u>61</u>	<u>65</u>	<u>72</u>	<u>65</u>	<u>54</u>	<u>49</u>	<u>45</u>
Losses, GWh	17						
Required Net Generation, GWh	78	84	90	81	68	61	56
of which:							
Diesel	78	58	90	81	68	61	56
Gas Turbine	-	26	-	-	-	-	-
Purchased Power	-	-	-	-	-	-	-
Installed Capacity, MW							
Diesel	60	60	60	60	60	60	60
Gas Turbine	57	57	-	-	-	-	-
	<u>117</u>	<u>117</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>	<u>60</u>
<u>Summary</u>							
Total Sales, GWh	1,320	1,893	2,202	2,905	3,415	3,960	4,804
Total Generation, GWh	1,537	2,203	2,653	3,503	4,093	4,717	5,688
Total Installed Capacity, MW	949	1,389	1,594	1,736	1,736	1,878	2,020

1/ Included in Government (Heavy) Industry.

2/ Effective Capacity.

Source: IBRD August, 1977

TABLE 3

## SYRIA RURAL ELECTRIFICATION

Available and Scheduled Generation, 1977 - 1982  
(EFE Interconnected System)

	1977	1978	1979	1980	1981	1982
<u>Available Net Generation, Gwh</u>						
<u>Hydro</u>						
Thawra	2,240	2,240	2,240	2,240	2,240	2,240
Other Hydro	50	50	50	50	50	50
<u>Steam (residual fuel, unless otherwise noted)</u>						
Ain Tell	84	84	84	84	84	84
Kattineh (2x15 MW)	108	108	108	108	108	108
Kattineh (3x30 MW) (residual coke fuel)	390	390	390	390	390	390
Kattineh (1x60 MW)	-	330	330	330	330	330
Hameh	170	170	170	170	170	170
Moharjeh	-	710	1,420	1,420	1,420	1,420
Banias	-	-	-	-	710	1,420
Firm Available Energy	3,042	4,082	4,792	4,792	5,502	5,912
<u>Gas Turbine</u>						
Souedie (Gas Fuel)	307	307	307	307	307	307
Other Gas Tb. (residual fuel)	-	260	260	260	260	260
Other Gas Tb. (light distillate)	167	167	167	167	167	167
<u>Co-Generation (Residual Fuel)</u>						
Banias Refinery, Sugar, Paper and Fertilizer Plants	-	100	200	300	300	300
Firm-up Energy	474	834	934	1,034	1,034	1,034
<u>Required Net Generation, Gwh</u>						
Margin, Gwh (on basis of firm energy), as percentage of required generation	2,184 858 39%	2,581 1,501 58%	3,422 1,370 40%	4,025 767 19%	4,656 846 18%	5,632 280 5%

TABLE 3

(Annex B)  
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TABLE 4  
PROJECT FINANCIAL PLAN  
(in US \$'000)

PROJECT COMPONENT	AID FX	IBRD FX	SARG LC	TOTAL		TOTAL
				FX	LC	
20 - kV Distribution	-	9,300	5,000	9,300	5,000	14,300
Distribution Transformers	-	3,800	800	3,800	800	4,600
380/220 - kV Low Tension System and Street Lighting	21,000	14,600	29,200	35,600	29,200	64,800
Engineering	3,300	-	1,300	3,300	1,300	4,600
SUBTOTAL	24,300	27,700	36,300	52,000	36,300	88,300
Physical Contingency (10%)	2,430	2,770	3,630	5,200	3,630	8,830
Price Contingency <sup>1/</sup>	7,970	9,030	22,100	17,000	22,100	39,100
TOTAL	34,700	39,500	62,000	74,200	62,000	136,200

<sup>1/</sup>Approximately  
30% FX and 35% LC

Source: IBRD, August, 1977

TABLE 5  
DETAILED COST ESTIMATES  
380/220 VOLT DISTRIBUTION SYSTEM  
INCLUDING STREET LIGHTING  
(in U.S. \$'000)

ITEM	QUANTITY	AID FX	IBRD FX	SARG LC	TOTAL	
					FX	LC
Conductor	18,333 kms. (total)	5,700	-	-	5,700	
Support Poles	110,580 Poles	-	9,900	9,900	19,800	
Service Drops	75,000 Drops	5,600	-	-	5,600	
Street Lights	58,200 Luminaries	4,000	-	-	4,000	
Hardware, Insulators, Clips, etc.	NA	5,700	400	-	6,100	
Indirect Foreign Exchange Costs of Construction	NA	-	4,300	-	4,300	
Local Costs of Construction and Installation	NA	-	-	29,200	-	29,200
TOTAL		21,000	14,600	29,200	35,600	29,200

ECONOMIC ANALYSIS

1. Electric Power Load Forecast

The electric power load forecast, the population and annual per capita KWH consumption for 1979 through 2008 are presented in Table 2. The major assumptions upon which that forecast was constructed are as follows:

a. The initial electric power consumption for connections in year one is 300 KWH per annum for residential consumers. Assuming family size at 5.8 individuals, the average annual per capita consumption is approximately 52 KWH. Domestic consumption was assumed to account for 100 percent of the demand for power. The 300 KWH figure is adequate to cover primarily the use of electric light and an iron.

b. The assumption was made that in the initial year of connection 50 percent of the population would request power service. By year three the percentage would increase to 80 percent and remain constant.

c. A three percent annual population growth rate was utilized for the service areas included in the project.

d. In estimating demand, the tariff rate for domestic residential consumption used was 24 PS/KWH. The existing tariff for domestic consumers in outlying areas not connected to the grid was 22 PS/KWH for Latakia, Tartous, El Bab, Masaiaf and Deir-oz-Zor and 24 PS/KWH for all other. The 24 PS/KWH was adopted as a reasonable approximation in the initial year of operation for the villages to be tied into the inter-connected system by this project.

e. The compounded rate of growth of demand for power used for the 1977-2008 time period was 18.2 percent. This compounded rate of growth was distributed by year as follows:

Year	1	2	3	4	5	6	7	8	9	10-30
Rate of Growth (%)	55.0	35.0	27.5	22.5	20.0	19.0	18.0	17.0	16.0	15.0

The basis for the selection of the major parameters in the electric power forecast are presented in Table 1. Column 3, for example, indicates that in the initial year of operation, a weighted average of 57 percent of potential consumers did request power service in five governorates with power available from the central

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grid. For areas with diesel generator supply (not interconnected), the relevant percentage was 52.5. Column 5 of that same table provides similar information for the initial level of power consumption and Column 6 for the average rate of power consumption over a five-year time span.

### 2. Consumer Ability to Pay

The average per capita income in the project area is \$737 or approximately \$4200 per family. The projected 300 KWH annual power consumption in the initial year of operation will cost the domestic consumer about LS 72 (300 KWH x PS 24) or less than \$20.00 per annum or 0.05 percent of annual family income. By the year 1990 when family power consumption is projected to increase to about 1130 KWH per annum (195.2 KWH per capita x 5.8 members per family), the total cost of power is calculated at about LS 270 (about \$68) or about 1.6 percent of the 1977 estimated family income of \$4200 per family.

House connection charges and meter costs as calculated by SOPRELEC were about \$100 per connection. Theoretically, EPE policy is to collect connection and meter costs directly from the consumer on the basis of actual costs. In practice, this apparently does not take place on any systematic basis. Even assuming that such one-time costs were billed and collected, the connection and meter costs are only 2.5 percent of estimated family income.

Given the estimated average family income available to households in the service area, ability to pay will not be a significant constraint as to power utilization at the KWH levels assumed in Table 2.

### 3. Economic Rate of Return

Table 3 presents the calculation of the economic rate of return for the Project.

The primary measure of the project's benefits is the revenues from electricity sales to domestic consumers. The only additional benefit is in the savings in fuel costs of the diesel generators that will be replaced by the interconnected system in generating power. The benefit side reflects the primary emphasis of the project on increasing the quality of life in the rural villages included in the project. No benefits are included in regard to irrigation benefits or to increases in industrial value added or

net profit.<sup>1/</sup> For the foreseeable future, it was assumed that diesel-operated pumps in operation in the project area are unlikely to be replaced by electric motor-driven irrigation pumps. The same assumption was made in regard to the conversion of self-generating units available to small industrial establishments. In summary, the basic impact of the Project will be on consumption, not on direct production activities. The availability of electric light, irons and other household appliances will provide the incentive to bring greater amenities to the rural sector in Syria.

The calculation of electricity sales revenue is based on an IBRD analysis of the marginal costs of providing the incremental power requirements of the project to the 20 KV substation for delivery to the medium and low-voltage system. The analysis calculated that the marginal costs up to that point in the power system was PS 13/KWH. The total price to the final consumer was taken as PS 24/KWH. As noted previously, the existing tariff rate to outlying area consumers receiving power from diesel generators is 24 PS/KWH. It was assumed that this price was the current real value for delivered power to retail consumers in the rural area from the inter-connected system. The assignable unit revenue per KWH to the Project is, therefore, PS 11/KWH, the difference between the delivered price (PS 24/KWH) and the marginal cost of delivering power to the 20 KV substation (PS 13/KWH).

Shadow priced estimates for both labor and foreign exchange were excluded. The Syrian labor market, currently and probably over the near future, reflects a shortage of the type of labor that will be required to construct and operate this project. The recent devaluation and the increased liberalization in Syrian foreign exchange practices would indicate that the current exchange rate (LS 3.95 = \$1.00) is a reasonable approximation to the true value of foreign exchange to the Syrian economy.

Capital investments (excluding price escalation but including the 10 percent physical contingency factor) and operations, maintenance and administration (at two percent of capital investment) comprised the Project's economic costs. With a 30-year time horizon, no salvage values were assigned to the Project in the terminal period. Included in the cost calculation are the cost of household connections and meters. In view of EPE practices noted previously, no offsetting income was

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<sup>1/</sup> Other plausible benefits have also been excluded because of the lack of reliable analytical information. For example, savings in kerosene currently being used by households for lighting and taxes on household appliances that are likely to be purchased in later stages of the project are excluded. The current state of benefit measurement also precludes inclusion of the impact of available electric power on the efficacy of the formal and informal educational system, rural-urban migration flows, employment generation, and even the longer term relationship to population growth rate.

included in the benefit stream.<sup>1/</sup> In addition to this exclusion, no cost offset is included for the transfer capital value of the diesel generators that will be replaced by the inter-connected central grid system. No information is available to make even a rough approximation of that item.

The economic rate of return calculated in Table 3 is 8.9 percent. A sensitivity analysis was undertaken for two of the major variables, construction costs and the real value of the power presented in column 2 of Table 3. A 20 percent increase in construction costs reduced the economic rate of return to 7.3 percent from 8.9 percent. The reduction in electricity sales revenue of 20 percent reduces the economic rate of return to 7.1 percent. Based on available knowledge of the probable outcome of either variable, this sensitivity analysis reflects an extreme and unlikely end result. It should also be noted that a 20 percent increase in revenue would increase the rate of return to approximately 10.5-11 percent.

According to IBRD sources, the opportunity cost of capital in Syria is approximately 10 percent. In view of the several conservative aspects in the rate of return calculation (e.g., no revenue offset to household connections and meter costs, no transfer value for diesel generators replaced, and the exclusive adoption of domestic consumption), excluding other likely benefits noted above), the calculated 8.9 percent economic rate of return is adequate to economically justify this project.

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<sup>1/</sup> Assuming that 80 percent of the connections by 1990 are new connections, the cumulative revenue loss by 1990 would total about \$16.5 million.

SYRIA RURAL ELECTRIFICATION PROGRAM

SELECTED INFORMATION ON HISTORICAL EXPERIENCE  
ON ELECTRIC POWER UTILIZATION AND GROWTH

<u>Governates</u> (1)	<u>Type of Supply</u> (2)	<u>Rate of Initial Connection</u> <u>In %</u> (3)	<u>Average Level of Consumption Per Connection</u> (4)	<u>Initial Level of Consumption Per Connection</u> <u>in kwh</u> (5)	<u>Average Rate of Growth Of Consumption</u> <u>in %</u> (Average of 5 Years) (6)
Aleppo	Grid	48	Newly Electrified	422	-
Damascus	Grid	90	1,176	1,047	47.0
Hama	Grid	57	759	601	47.9
Homs	Grid	44	401	352	42.0
Idlib	Grid	48	Newly Electrified	173	-
<u>Weighted Average for Grid</u>		<u>57</u>	<u>1,044</u> <sup>1/</sup>	<u>534.0</u>	<u>46.7</u>
Aleppo	Diesel	49	283	260	18.0
Doraa	Diesel	27	310	196	32.0
Deir ez Zor	Diesel	30	482	236	22.8
Hama	Diesel	-	414	227	29.3
Hassakeh	Diesel	62	678	451	22.0
Homs	Diesel	-	304	-	23.8
Idlib	Diesel	37	152	135	15.7
Lattakieh	Diesel	60	480	-	9.4
Raqqa	Diesel	81	-	-	6.4
Soueida	Diesel	49	123	160	16.4
Tartous	Diesel	82	729	191	24.4
<u>Weighted Average for Diesel</u>		<u>52.5</u>	<u>415.0</u>	<u>240.0</u>	<u>20.2</u>

<sup>1/</sup> Average is not reasonable because of heavy bias introduced by Damascus.

SOURCE: IBRD, August 1977

TABLE 1

(Annex C)  
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TABLE 2

(Annex C)  
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## SYRIA RURAL ELECTRIFICATION PROGRAM

LOAD FORECAST FOR PHASE I, POPULATION AND  
PER CAPITA CONSUMPTION, 1979-2008

(1)	Load Forecast (GWh)				Population (000) (6)	Per Capita kwh/ Annual Consumption (7)
	1st Year (2)	2nd Year (3)	3rd Year (4)	Total (Col 2, 3 & 4) (5)		
1979	15.8	-	-	15.2	308.1	51.3
1980	22.1	10.5	-	32.6	564.1	57.6
1981	22.7	14.6	12.0	55.3	927.6	59.4
1982	35.3	19.0	16.8	71.1	955.4	74.4
1983	41.3	23.4	21.9	86.6	984.1	88.0
1984	47.5	27.4	26.9	101.8	1013.6	100.4
1985	54.7	31.5	31.5	117.7	1044.0	112.7
1986	62.9	36.2	36.2	135.3	1075.3	125.8
1987	72.3	41.6	41.6	155.5	1107.6	140.4
1988	83.1	47.9	47.8	178.8	1140.8	156.7
1989	95.6	55.1	55.0	205.7	1175.0	175.1
1990	109.9	63.3	63.3	236.5	1210.3	195.4
1991	126.4	72.8	72.8	272.0	1246.6	218.2
1992	145.3	83.8	83.7	312.8	1284.0	243.6
1993	167.1	96.3	96.2	359.6	1322.5	271.9
1994	192.2	110.8	110.7	413.7	1362.2	303.7
1995	221.0	127.4	127.3	475.7	1403.0	339.1
1996	254.2	146.5	146.3	547.0	1445.1	378.5
1997	292.3	168.5	168.3	629.1	1488.5	422.7
1998	336.2	193.7	193.5	723.4	1533.1	471.8
1999	386.6	222.8	222.6	832.0	1579.1	526.9
2000	444.6	256.2	256.0	956.8	1626.5	588.3
2001	511.3	294.7	294.3	1100.3	1676.3	656.8
2002	588.0	338.9	338.5	1265.4	1725.5	733.3
2003	676.2	389.7	389.3	1455.2	1777.3	818.8
2004	777.6	448.1	447.7	1673.4	1830.6	914.1
2005	894.3	515.4	514.8	1929.5	1885.5	1020.7
2006	1028.4	592.7	592.0	2213.1	1942.1	1139.5
2007	1182.7	681.6	680.8	2545.1	2004.4	1272.3
2008	1360.1	783.8	730.0	2926.9	2060.4	1420.6

TABLE 3

(Annex C)  
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## SYRIA RURAL ELECTRIFICATION PROGRAM

ECONOMIC RATE OF RETURN CALCULATION  
(US \$ '000)

Year (1)	BENEFITS			TOTAL COSTS			Net Benefits (8)
	Electricity Sales Revenue (2)	Fuel Savings (3)	Total Benefits (Col 2 + Col 3) (4)	Capital Invest (5)	Oper., Maint, & Ad- min. (6)	Total Costs (Col 5 + Col 6) (7)	
0	-	-	-	5000	-	5000	(5000)
1	439	121	560	24150	583	24773	(24173)
2	906	225	1131	29151	1166	30317	(29186)
3	1537	336	1873	38874	1943	40817	(38944)
4	1977	336	2313	-	1943	1943	370
5	2407		2743	-			800
6	7830		3166	-			1773
7	3272		3608	-			1665
8	3761		4097	-			2154
9	4323		4659	-			2716
10	4971		5307	-			3364
11	5718		6054	-			4111
12	6575		6911	-			4968
13	7562		7898	-			5955
14	8696		9032	-			7089
15	9997		10333	-			8390
16	11507		11845	-			9902
17	13225		13561	-			11618
18	15207		15543	-			13600
19	17489		17825	-			15882
20	20111		20447	-			18504
21	23130		23466	-			21523
22	26599		26935	-			24992
23	30588		30924	-			28981
24	35178		35514	-			33571
25	40455		40791	-			38848
26	46521		46857	-			44914
27	53640		53976	-			52033
28	61524		61860	-			59917
29	70754		71090	-			69147
30	81368	336	81704	-	1943	1943	79761

RATE OF RETURN 8.9%

1/ Based on PS11/KWH price converted to \$0.0278/KWH at LS 3.95= \$1.00

SOURCE: All data except for distribution of capital investments (Col. 5)  
obtained from IBRD, August 1977.

## FINANCIAL ANALYSIS

### 1. Past Performance - 1972 - 1976

#### Balance Sheets

EPE's 1972-1976 balance sheets shown are in Table 1. Gross fixed assets are stated at their 1968 values, the year when the accounts were consolidated for the five main cities. Smaller systems were brought in at the value at which they were appraised on acquisition. New assets are included at cost plus interest charged to construction.

Very little construction was completed from 1971-1973. Substantial work was undertaken in 1974 on EPE's general distribution and gas turbine installations, resulting in a 275 percent increase in gross assets by the end of 1976.

Consumer's outstanding electricity accounts reflect an overall average of 153 days at the end of 1976; the amounts unpaid are almost entirely accounts due from government-owned organizations and to the public sector. Pre-1973 municipal accounts amounting to LS 4.4 million are debts due from municipalities of various small towns and villages, are still outstanding.

The debt equity ratio for 1976 is shown as 12:86, reflecting the treatment of interest-free debts as government equity. Long-term debts increased from LS 46 million in 1972 to LS 194 million in 1976 reflecting the IBRD loans for Mehardeh and the promissory notes signed for financing the gas turbines.

#### Income Statements

EPE's income statements (Table 2) show that net operating revenues decreased from LS 20.4 million in 1972 to LS 9.5 million in 1976, with losses of LS 28.3 million in 1974 and LS 18.1 million in 1975. The decreases resulted from restricted sales and the increased costs of generation from diesel and gas turbines installed to replace the lost steam capacity and the unusually large costs of rebuilding of diesel units and maintenance on the gas turbines. EPE's average sales prices for electricity increased slightly from 12.1 ps/kWh in 1972 to 12.7 ps/kWh (US¢3.3/kWh) in 1976.

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The agreements under IBRD Loans 986-SYR and 1144-SYR provide that EPE will maintain its overall average electricity tariffs at a level at least as high as that of May 31, 1973, until December 31, 1977, and that from that date EPE shall earn a return of not less than 9 percent on revalued average net fixed assets in operation. The impact of additional costs and lost revenues resulted in the rate of return dropping from 12.5 percent in 1973 to the losses in 1974 and 1975, and only a return of 1.6 percent in 1976.

In 1973, the cost of the losses at Katteneh and Hameh (LS 36.8 million) were written off as a special charge resulting in a net loss for the year of LS 15.7 million.

## 2. Future Performance - 1977 - 1982

### Construction Program

The cost of EPE's construction program is now estimated to be LS 6.2 billion. Gross fixed assets will amount to an estimated LS 7 billion by 1982 (US\$1.77 billion).

### Forecast Income Statements

EPE did not take the expected action of gradually increasing tariffs to the required level for 1978 resulting in net operating losses in 1974 and 1975. Electricity generated by the Thawra hydroelectric facilities eased substantially the operating costs for 1976 and produced a small net operating profit. On the basis of the present forecasts (see Table 2), and providing the availability of hydroproduction of electricity, the overall average sales price of electricity must be increased from the present average of 12.7 ps/kWh to approximately 15.5 ps/kWh as of January 1, 1978 to earn a nine percent rate of return on average net fixed assets in service for 1978. Additional increases will also be necessary in 1980 (to 16.9 ps/kWh), 1981 (to 19.0 ps/kWh), and 1982 (to 19.5 ps/kWh) in order to result in a rate of return of 9.0 percent on average net fixed assets in service.

Table 3 provides the possible impact on EPE's rate of return on average net fixed assets in service if the rate increases included in Table 2 are not implemented. In 1978, rather than a 9.0 percent rate of return, the rate of return is 5.5 percent. In 1982, the rate of return declines to 2.6 percent. Column 8 of Table 3 indicates that the losses in

electricity revenues for 1977-1982 under the constant 1977 sales price would be about LS 862 million. This amount is almost one-third of the government construction grants (LS 2,663.9 million) shown in Table 1 for the 1977-82 time-period and about 25 percent of the projected total electricity revenue under the assumption as to meeting the 9.0 percent rate of return IBRD requirement. These results strongly support the decision by AID to require the submission of an effective IBRD loan agreement as a condition precedent to disbursement for equipment and material under the AID loan.

It should be emphasized that even without the increase in the level of electric power rates to achieve the 9.0 percent return on average net fixed assets, EPE is a financially viable utility. The net operating revenue would still be adequate to meet all recurring costs of the system, including operations, maintenance and administration, and debt service obligations. It would substantially reduce EPE's contribution to their 1977-1982 capital investment expansion program from the LS 1,382.2 million noted in the table below (Financing Plans and Funds Statement, 1977-1982 Program) to only LS 520.3 million (from 22 percent to nine percent of total capital investment requirements) and require additional funds from non-EPE sources.

#### Forecast Balance Sheets

The most significant change in the forecast balance sheets during the 1977-1982 period is the rate of growth of its net fixed assets in service from LS 1,162 million in 1977 to LS 5,875 million by 1982. There is also a substantial increase in the long-term debt of EPE which increases from LS 399.6 million in 1977 to LS 2,073.9 by 1982. This reflects the financing of EPE's expansion program from sources other than the government. The debt equity ratio (about 20:80 to 25:75) indicates low borrowings, but the classification of government construction grants as equity significantly effects that ratio. <sup>1/</sup> The estimated debt service coverage for the period 1977-1982 varies from 2.8 to 3.7 (see Table 4).

Accounts receivable from consumers as of 1976 is rather large. Assuming government's action to require prompt payment of bills for electricity it is estimated that the overall level of electricity accounts owned by consumers will fall from the present 153 days to slightly over 60 days by the end of 1982. Inventory levels reflect the normal expansion of materials required to sustain the enlarged operations of EPE.

### 3. Financing Plan and Funds Statement

The detail of EPE's sources and applications of funds statement for 1977-1982 is shown in Table 4. The plan shows that EPE will be able to finance through internally-generated funds 22 percent of its construction program from 1977 through 1982; 43 percent of the program will

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<sup>1/</sup> It should be mentioned that the SARG requested that the AID loan be passed through to EPE as an equity contribution. The financial analyses (based on IBRD data) includes the AID financial participation in the project as a 40-year loan to EPE with a two and three percent (2%-3%) interest rate.

require financing by or through the government. EPE's existing loans amount to eight percent of the total construction program for 1977 through 1982, and future foreign borrowing by EPE is estimated at LS 1,330.5 million, amounting to 22 percent of the total construction program. Government capital contributions are interest-free, but are termed "development loans" under Syrian Law since they are considered to be repayable if surplus funds are available. Since the bulk of the contributions are unlikely to ever be repaid in view of EPE's continuing need for expansion, the government's capital contributions are included as increases in equity in the balance sheet and for the purposes of calculating the debt service coverage. A summary table outlining that plan is presented below:

FINANCING PLANS AND FUNDS STATEMENT  
1977-1982 PROGRAM

<u>CONSTRUCTION PROGRAM</u>	<u>(LS MILLIONS)</u>	<u>(US MILLIONS)</u>	<u>%</u>
The Project -	620.6		
(Regional Electrification Phase I)		157.1	10
Other Construction	<u>5,603.3</u>	<u>1,418.6</u>	<u>90</u>
TOTAL CONSTRUCTION	<u>6,223.9</u>	<u>1,575.7</u>	<u>100</u>
 <u>SOURCES OF FINANCING</u>			
<u>INTERNAL RESOURCES</u>			
Net Case Generation	2,348.3	594.5	
Less Change in Working Capital	279.7	70.8	
Less Debt Service	<u>686.4</u>	<u>173.8</u>	
NET INTERNAL RESOURCES	1,382.2	349.9	22
 <u>LONG TERM BORROWING</u>			
Proposed Bank Loan	118.5	30.0	2
AID Financing	137.0	34.7	2
IBRD - Loan 986	80.6	20.4	
- Loan 1144	259.1	65.7	
Kuwait Fund	127.6	32.3	
Abu Dhabi Credit	41.6	10.5	
Existing Foreign Notes	<u>17.0</u>	<u>4.3</u>	8
Future Foreign Loans	1,330.5	336.8	22
Government Grants (Net of Repayments)	2,663.9	674.4	43
Consumer's Contributions	<u>65.9</u>	<u>16.7</u>	<u>1</u>
TOTAL SOURCES OF FINANCING	<u>6,223.9</u>	<u>1,575.7</u>	<u>100</u>

NOTE: LS 3.95 = \$1.00

SYRIA RURAL ELECTRIFICATION PROGRAM

Main Assumptions and Explanatory Notes

for the

Financial Forecasts - 1977-1982

GENERAL

The independent auditors (Talal Abu-Ghazaleh & Co.) have not completed the audits for 1974 and 1975 as of this date. The final audit report could change the financial data shown as actual. EPE has not closed their books for 1976 but estimated 1976 accounts are shown as "actual" and are subject to final closing and to adjustments from audited 1974 and 1975 accounts.

BALANCE SHEET

1. Gross Fixed Assets: Carried at "Book Value" until EPE, with the assistance of consultants, implements the proposed uniform system of accounts and the proposed methods of revaluing assets.
2. Depreciation: The applied depreciation is for rate making purposes as opposed to the required depreciation of Syria for tax purposes. The applied annual rates are:
  - Buildings 3%
  - Hydro generating facilities 3.5%
  - Thermal plants 4%
  - Gas turbines 6.6%
  - Diesel generating units 4.5%
  - Transmission and distribution 4.5%
  - General plant 3%
3. Accounts Receivable: As of the end of 1976 the receivables averaged 160 days, this is reduced to 60 days as of the end of 1982 assuming that the government will pay promptly their accounts. Through 1977, a LS 4.4 million pre-1973 municipal account was included with accounts receivable. It was assumed that by 1978, the government was able to clear this account.

4. Inventories: Increased from 1972-1976 due to frequent maintenance requirements of diesels and gas turbines, which should decrease as most of electricity generation will be from hydro facilities beginning in mid-1976 and thermal generating plants in mid-1979.
5. Sundry Debit Accounts: Includes sales of generators to military, hospitals, etc. and miscellaneous debits to pole plant manufacturing.
6. Accounts Payable: Assumed at two months fuel costs and approximately one month's local construction costs.
7. Meth Regional Balance: Accounts from the six regional accounting officers that require final classification and assignment to an accounting period. By 1978, the accounting system should permit these items to be assigned to their appropriate accounts for a specific year.
8. Government Formation: SARG payment for private power system when nationalized. Carried as equity on books.
9. Government Transfer of Thawra Assets: Assumes that the Thawra assets will be transferred to EPE as government's equity contribution.
10. Government Construction Grants: From the budgets approved by the Government of Syria, includes "grants in kind" and cash grants which are reported net of EPE repayments.
11. Long-term Debts: Includes outstanding loans signed, loans to be signed, and assuming that EPE will finance approximately 20 percent of their planned construction program. Projected long-term borrowing are presented in Table 5.

INCOME STATEMENTS

1. Electricity Revenues: Assuming tariff increase effective January 1, 1978 to produce an average sales price of 15.6 P (S) per kWh and increases in 1980, 1981 and 1982 that will produce average sales prices of 16.9, 19 P(S) and 19.5 P(S) respectively.
2. Other Revenues: Includes meter rents, income from works for consumers, manufacture at pole plants, etc.
3. Personnel Costs: Additional staffing is estimated to increase from the present 15,000 employees to approximately 22,000 employees in 1982. Average salary increases are estimated at eight percent from 1978-1982.
4. Fuel Costs: Calculated on the expected requirements of each station at the existing fuel prices established by the SARG.
5. Taxes: No corporate income tax is payable by EPE as from 1973, only minor taxes are applied.
6. Average Net Fixed Assets in Service: Average of beginning and end of calendar year.

SYRIA RURAL ELECTRIFICATION PROGRA  
BALANCE SHEETS  
ACTUAL 1972-76: FORECAST 1977 - 1982  
(L(S) MILLIONS)

Line No.	I T E M (1)	A C T U A L					F O R E C A S T					
		1972 (2)	1973 (3)	1974 (4)	1975 (5)	1976 (6)	1977 (7)	1978 (8)	1979 (9)	1980 (10)	1981 (11)	1982 (12)
<b>ASSETS</b>												
<b>Fixed Assets</b>												
	Gross Fixed Assets in service	344.6	351.9	4,827	727.7	965.9	1,437.9	2,293.9	2,906.9	4,113.3	5,566.8	6,999.8
	Less: Accumulated Depreciation	103.6	116.6	140.9	160.8	206.6	276.3	369.6	484.7	644.6	858.3	1125.2
	Net Fixed Assets in Service	241.0	235.3	341.8	567.1	759.3	1,161.6	1,924.3	2,422.2	3,468.7	4,708.5	5,874.6
	Work in Progress	31.8	113.0	166.6	172.6	625.2	828.6	1,150.5	1,480.6	1,660.2	1,477.2	1,576.0
	Other Investments	.3	.7	.3	.3	.3	.3	.5	.5	.7	1.0	1.5
	<b>TOTAL FIXED ASSETS</b>	<b>271.3</b>	<b>349.0</b>	<b>508.7</b>	<b>740.0</b>	<b>1,384.8</b>	<b>1,990.5</b>	<b>3,075.3</b>	<b>3,903.3</b>	<b>5,129.6</b>	<b>6,186.7</b>	<b>7,452.1</b>
<b>CURRENT ASSETS</b>												
	Cash	9.3	32.8	21.1	67.1	63.7	63.7	62.5	61.0	58.3	58.9	45.1
	Accounts Receivable	45.0	49.2	57.7	70.1	74.8	108.1	137.4	100.0	120.0	140.0	155.0
	Inventories	51.2	71.9	69.2	93.8	69.9	100.0	125.0	140.0	193.5	250.0	300.0
	Sundry Debit Accounts	87.5	88.1	87.3	192.3	194.0	195.0	196.0	197.0	198.0	199.0	200.0
	<b>TOTAL CURRENT ASSETS</b>	<b>193.0</b>	<b>242.0</b>	<b>235.3</b>	<b>423.3</b>	<b>429.4</b>	<b>466.8</b>	<b>520.9</b>	<b>498.0</b>	<b>569.8</b>	<b>698.2</b>	<b>700.1</b>
<b>CURRENT LIABILITIES</b>												
	Accounts Payable	101.7	72.8	166.0	175.6	189.0	192.0	120.0	105.0	120.0	135.0	150.0
	Net Regional Accounts	(21.7)	59.3	(36.1)	(33.5)	(30.00)	(35.0)	-	-	-	-	-
	<b>TOTAL CURRENT LIABILITIES</b>	<b>80.0</b>	<b>132.1</b>	<b>129.9</b>	<b>142.1</b>	<b>159.0</b>	<b>157.0</b>	<b>120.0</b>	<b>105.0</b>	<b>120.0</b>	<b>135.0</b>	<b>150.0</b>
	Net Current Assets	113.0	109.9	105.4	281.2	270.4	309.8	400.9	393.0	449.8	513.2	550.1
	<b>TOTAL NET ASSETS</b>	<b>386.1</b>	<b>458.9</b>	<b>614.1</b>	<b>1,021.2</b>	<b>1,655.2</b>	<b>2,300.3</b>	<b>3,476.2</b>	<b>4,296.3</b>	<b>5,579.4</b>	<b>6,699.9</b>	<b>8,002.2</b>
<b>EQUITY AND LONG-TERM DEBT</b>												
<b>EQUITY</b>												
	Government Formation	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4
	Government Transfer-THARWA Assets	-	-	-	-	-	-	400.0	400.0	400.0	400.0	400.0
	Government Construction Grants (Net)	56.4	96.0	244.5	628.5	118.3	1,586.0	1,994.5	2,364.4	2,985.6	3,346.4	3,846.9
	Customer Contributions	57.5	60.1	65.6	74.7	86.7	93.7	101.3	109.7	118.5	127.5	136.7
	Reserves	18.9	21.0	39.5	48.8	30.4	37.3	46.6	58.1	74.0	95.4	122.1
	Surplus	171.4	155.7	131.1	112.0	111.4	131.4	241.0	412.6	636.8	951.1	1,357.8
	<b>TOTAL EQUITY</b>	<b>329.6</b>	<b>358.2</b>	<b>506.1</b>	<b>869.4</b>	<b>1,436.9</b>	<b>1,873.8</b>	<b>2,808.8</b>	<b>3,370.2</b>	<b>4,240.3</b>	<b>4,946.0</b>	<b>5,888.9</b>

TABLE 1

SYRIA RURAL ELECTRIFICATION PROGRAM  
BALANCE SHEETS  
ACTUAL 1972-76: FORECAST 1977 - 1982  
(L(S) MILLIONS)

Line No.	I T E M (1)	A C T U A L					F O R E C A S T					
		1972 (2)	1973 (3)	1974 (4)	1975 (5)	1976 (6)	1977 (7)	1978 (8)	1979 (9)	1980 (10)	1981 (11)	1982 (11)
<u>LONG-TERM LIABILITY</u>												
	Customer's Security											
	Deposits	10.8	11.6	14.4	21.4	24.5	26.9	29.4	32.0	34.7	37.5	40.4
	Long Term Debts	<u>45.7</u>	<u>89.1</u>	<u>93.6</u>	<u>110.4</u>	<u>193.8</u>	<u>399.6</u>	<u>638.0</u>	<u>894.1</u>	<u>1,304.4</u>	<u>1,716.4</u>	<u>2,072.9</u>
	TOTAL EQUITY AND LONG-TERM DEBT	<u>386.1</u>	<u>458.9</u>	<u>614.1</u>	<u>1,021.2</u>	<u>1,655.2</u>	<u>2,300.3</u>	<u>3,476.2</u>	<u>4,296.3</u>	<u>5,579.4</u>	<u>6,699.9</u>	<u>8,002.2</u>
	DEBT-EQUITY RATIO	15:85	22:78	18:82	13:87	13:87	19:81	19:81	22:78	24:76	26:74	26:74

Note: Years ended December 31

Source: IBRD, August 1977

Continued - Table 1

(Annex D)  
Page 9 of 13

SYRIA RURAL ELECTRIFICATION PROGRAM  
 INCOME STATEMENTS  
 ACTUAL - 1972-1976; FORECAST - 1977-1982  
 (L.S) MILLIONS)

Line No.	I T E M	ACTUAL						FORECAST				
		1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
	Purchased Power - GWH	11	119	408	729	1,200	1,665	32	182	207	232	232
	Generated: Thermal - GWH	989	892	651	552	308	571	349	1,031	1,516	2,195	3,166
	Hydroelectric - GWH	62	17	31	28	29	32	2,290	2,290	2,290	2,290	2,290
	Total Purchased & Generated - GWH	1,062	1,028	1,090	1,309	1,537	2,268	2,671	3,503	4,093	4,717	5,638
	Sales - GWH	837	816	934	1,102	1,320	1,943	2,202	2,905	3,415	3,960	4,304
	Average Sales Price P(S)/KWH	12.1	12.9	12.9	12.9	12.7	12.7	15.5	15.5	16.9	19.0	19.5
	<b>REVENUES:</b> Electricity	100.9	104.9	121.2	139.9	167.6	246.8	340.3	449.9	575.8	753.4	937.8
	Other	9.3	9.9	2.8	14.5	12.0	12.0	12.5	12.5	13.0	13.0	13.5
	<b>TOTAL OPERATING REVENUES</b>	<u>110.2</u>	<u>114.8</u>	<u>124.0</u>	<u>154.4</u>	<u>179.6</u>	<u>258.8</u>	<u>352.8</u>	<u>262.4</u>	<u>588.8</u>	<u>766.4</u>	<u>951.3</u>
	<b>EXPENSES:</b>											
	Personnel	33.1	37.0	52.8	66.5	76.0	87.0	100.0	120.0	130.0	140.0	150.0
	Fuel	23.4	14.9	33.3	38.9	11.4	20.3	9.7	19.9	21.6	31.6	44.6
	Purchased Power	.9	10.3	23.9	11.5	18.4	25.0	.3	1.5	1.8	2.0	2.0
	Materials	5.8	8.6	8.6	11.3	12.1	15.4	12.0	12.0	12.5	13.5	14.4
	Administrative & Transport	2.5	2.2	2.6	4.1	4.2	4.4	4.7	5.0	5.3	5.5	5.8
	Depreciation	11.7	13.2	26.6	35.0	45.8	60.7	93.3	115.1	159.9	213.7	266.9
	Other											
	<b>TOTAL EXPENSES</b>	<u>89.8</u>	<u>92.4</u>	<u>152.3</u>	<u>172.5</u>	<u>170.1</u>	<u>224.2</u>	<u>222.7</u>	<u>276.4</u>	<u>334.0</u>	<u>409.5</u>	<u>487.0</u>
	<b>Net Operating Revenue</b>	<u>20.4</u>	<u>22.4</u>	<u>(28.3)</u>	<u>(18.1)</u>	<u>9.5</u>	<u>34.6</u>	<u>130.1</u>	<u>136.0</u>	<u>254.8</u>	<u>356.9</u>	<u>464.3</u>
	<b>Other Income &amp; Expenses</b>											
	Net Interest	.4	.5	7.6	2.6	(6.1)	(7.7)	(11.2)	(2.9)	(14.7)	(21.0)	(31.1)
	Extraordinary Loss or Income	.3	(36.5)	(1.3)	(1.3)	.5	-	-	-	-	-	-
	<b>TOTAL OTHER INCOME &amp; EXPENSES</b>	<u>.7</u>	<u>(36.0)</u>	<u>6.3</u>	<u>1.2</u>	<u>5.6</u>	<u>(7.7)</u>	<u>(11.2)</u>	<u>(2.9)</u>	<u>(14.7)</u>	<u>(21.0)</u>	<u>(31.1)</u>
	Income From Operations	21.1	(13.6)	(22.0)	(16.8)	3.9	26.9	118.9	183.1	240.1	335.9	433.2
	Less: Reserves	(1.7)	(2.1)	(2.6)	(2.3)	(4.5)	(6.9)	(9.3)	(11.5)	(15.9)	(21.4)	(26.7)
	<b>Equals: Retained Surplus For Year</b>	<u>19.4</u>	<u>(15.7)</u>	<u>(24.6)</u>	<u>(19.1)</u>	<u>(.6)</u>	<u>20.0</u>	<u>109.6</u>	<u>171.6</u>	<u>224.2</u>	<u>314.5</u>	<u>406.5</u>
	Average Net Fixed Assets In Service	186.6	179.4	225.7	384.3	582.5	870.3	1445.5	2067.8	2831.4	3965.6	5159.5
	Rate of Return	11.1	12.5	-	-	1.6	4.0	9.0	9.0	9.0	9.0	9.0

NOTE: YEARS ENDED DECEMBER 31

SOURCE: IBRD, August 1977

TABLE 2

(Annex D)  
Page 10 of 13

SYRIA RURAL ELECTRIFICATION PROGRAM  
 RECALCULATION OF REVISED NET OPERATING REVENUES AND  
 RATE OF RETURN BASED ON CONSTANT 1977 AVERAGE SALES PRICE

I T E M (1)	1977 (2)	1978 (3)	1979 (4)	1980 (5)	1981 (6)	1982 (7)	TOTAL 1977-82 (8)
Sales GWH	1,943	2,202	2,905	3,415	3,960	4,804	
Average Sales Price (PS/kwh)							
With IBRD Projected Rate Increase <sup>1/</sup>	12.7	15.5	15.5	16.9	19.0	19.5	
Contract - 1977 Sales Price	12.7	17.7	12.7	12.7	17.7	17.7	
<u>ELECTRICITY REVENUES (LS Missions)</u>							
With IBRD Projected Rate Increase <sup>1/</sup>	246.8	340.3	449.9	575.8	753.4	937.8	3,304.0
Contract 1977 Sales Price	246.8	279.7	368.9	433.7	502.9	610.1	2,442.1
Difference	-	(60.6)	(81.0)	(142.1)	(250.5)	(327.7)	(861.9) <sup>2/</sup>
Net Operating Revenue - Revised	34.6	69.5	105.0	112.7	106.4	136.6	
Average Net Fixed Assets in Service	870.3	1,445.5	2,067.8	2,831.4	3,965.6	5,159.5	
Rate of Return on Average Net Fixed Assets in Service With IBRD Rates <sup>1/</sup>	4.0	9.0	9.0	9.0	9.0	9.0	
Rate of Return on Average Net Fixed Assets in Service Based on 1977 Rates	4.0	5.5	5.1	4.0	2.8	2.6	

NOTE: YEARS ENDED DECEMBER 31

<sup>1/</sup> From Table

<sup>2/</sup> Government grants are scheduled as LS Millions - 2,663.9. Reduction in net operating revenues is equal to 32 percent of that amount.

Source: IBRD, August 1977

TABLE 3

(Annex D)  
Page 11 of 13

SYRIA RURAL ELECTRIFICATION PROGRAM  
SOURCES AND APPLICATIONS OF FUNDS  
1977-1982  
(LS MISSIONS)

I T E M (1)	1977 (2)	1978 (3)	1979 (4)	1980 (5)	1981 (6)	1982 (7)	Total 1977-1982 (8)
<b>SOURCES</b>							
<u>Net Cash Generation</u>							
Net Operating Revenues	34.6	130.1	186.0	254.8	356.9	464.3	1,426.7
Other Income	.5	.5	.5	.5	.5	.5	3.0
Depreciation	69.7	93.3	115.1	159.9	213.7	266.9	918.6
NET CASH GENERATION	<u>104.8</u>	<u>223.9</u>	<u>301.6</u>	<u>415.2</u>	<u>571.1</u>	<u>731.7</u>	<u>2,348.3</u>
<u>CAPITAL</u>							
Change in Working Capital (Excl. Cash)	(39.4)	(92.3)	6.4	(55.5)	(62.8)	(50.7)	(298.3)
Consumers Contributions & Depots	9.4	10.1	11.0	11.5	11.8	12.1	65.9
Government Grants	403.0	408.5	369.9	621.2	361.3	500.0	2,663.9
TOTAL CAPITAL	<u>373.0</u>	<u>326.3</u>	<u>387.3</u>	<u>573.2</u>	<u>310.3</u>	<u>461.4</u>	<u>2,431.0</u>
LONG TERM BORROWING <sup>1/</sup>	226.0	264.6	300.4	474.4	486.5	360.0	2,111.9
TOTAL SOURCES	<u>703.8</u>	<u>814.8</u>	<u>989.3</u>	<u>1,462.8</u>	<u>1,367.9</u>	<u>1,553.1</u>	<u>6,891.7</u>
<b>APPLICATIONS</b>							
<u>CONSTRUCTION COSTS</u>							
Project	-	5.5	199.5	204.0	211.6	-	620.6
Other	666.7	748.1	692.4	1,135.3	1,001.5	1,359.3	5,603.3
TOTAL CONSTRUCTION COSTS	<u>666.7</u>	<u>753.6</u>	<u>891.9</u>	<u>1,339.3</u>	<u>1,213.1</u>	<u>1,359.3</u>	<u>6,223.9</u>
<u>Debt Service<sup>1/</sup></u>							
Interest	16.9	36.2	52.6	81.7	101.2	114.8	403.4
Amortization	20.2	26.2	46.3	44.5	53.0	92.8	283.0
TOTAL DEBT SERVICE	<u>37.1</u>	<u>62.4</u>	<u>98.9</u>	<u>126.2</u>	<u>154.2</u>	<u>207.6</u>	<u>686.4</u>
Change in Cash	-	(1.2)	(1.5)	(2.7)	.6	(13.8)	(18.6)
TOTAL APPLICATIONS	<u>703.8</u>	<u>814.8</u>	<u>989.3</u>	<u>1,462.8</u>	<u>1,367.9</u>	<u>1,553.1</u>	<u>6,891.7</u>
<u>TIMES DEBT SERVICE COVERED BY NET CASH GENERATION</u>	<u>2.8</u>	<u>3.6</u>	<u>3.0</u>	<u>3.3</u>	<u>3.7</u>	<u>3.5</u>	

NOTE: YEARS ENDED DECEMBER 31.

Details shown in Table

Source: IBRD August 1977

TABLE 4

(Annex D)  
Page 12 of 13

SYRIA RURAL ELECTRIFICATION PROGRAM  
LONG-TERM BORROWING AND DEBT SERVICE, 1977-1982  
 (LS MILLIONS)

I T E M (1)	1977 (2)	1978 (3)	1979 (4)	1980 (5)	1981 (6)	1982 (7)	Total 1977-1982 (8)
<u>LONG-TERM BORROWING</u>							
IBRD Loan 986-SYR	34.8	31.6	14.2	-	-	-	80.6
1144-SYR	140.7	78.9	27.7	11.8	-	-	259.1
Proposed	-	-	35.5	39.5	43.5	-	118.5
Kuwait Fund	18.5	70.2	25.0	13.9	-	-	127.6
ABU DHABI Credit	15.0	20.0	6.6	-	-	-	41.6
Existing Foreign Promissory Notes	17.0	-	-	-	-	-	17.0
Future EPE Borrowing	-	60.4	120.7	349.4	440.0	360.0	1,330.5
Proposed AID Loan	-	3.5	70.7	59.8	3.0	-	137.0
TOTAL	<u>226.0</u>	<u>264.6</u>	<u>300.4</u>	<u>474.4</u>	<u>486.5</u>	<u>360.0</u>	<u>2,111.9</u>
<u>DEBT SERVICE</u>							
<u>INTEREST</u>							
IBRD Loan 986-SYR	4.3	7.4	9.1	9.1	8.6	7.9	46.4
1144-SYR	6.8	13.4	18.5	23.0	22.7	22.2	106.4
PROPOSED	-	3.0	6.5	9.0	10.1	9.5	38.1
Kuwait Fund	.8	3.1	4.0	4.2	3.8	3.2	19.1
ABU DHABI Credit	.9	1.8	2.1	2.0	1.9	1.7	10.4
Existing Foreign Promissory Notes	4.3	4.6	4.5	4.4	4.3	4.2	26.3
Future EPE Borrowing	-	2.8	7.0	28.3	47.0	63.3	148.4
Proposed AID Loan	-	0.1	.9	1.7	2.8	2.8	8.3
TOTAL INTEREST	<u>16.9</u>	<u>36.2</u>	<u>52.6</u>	<u>81.7</u>	<u>101.2</u>	<u>114.8</u>	<u>403.4</u>
<u>AMORTIZATION</u>							
IBRD Loan 986-SYR	-	1.2	5.9	6.7	7.9	9.2	30.9
1144-SYR	-	2.3	4.9	5.3	5.8	6.3	24.6
PROPOSED	-	-	-	-	-	6.3	8.8
Kuwait Fund	-	3.4	13.6	13.6	13.6	13.6	57.8
ABU DHABI Credit	-	-	3.4	3.4	3.4	3.4	13.6
Existing Foreign Promissory Notes	20.2	19.3	18.5	15.5	13.5	10.1	97.1
Future EPE Borrowing	-	-	-	-	8.8	41.4	50.2
Proposed AID Loan	-	-	-	-	-	-	-
TOTAL AMORTIZATION	<u>20.2</u>	<u>26.2</u>	<u>46.3</u>	<u>44.5</u>	<u>53.0</u>	<u>92.8</u>	<u>283.0</u>
TOTAL DEBT SERVICE	<u><u>37.1</u></u>	<u><u>62.4</u></u>	<u><u>98.9</u></u>	<u><u>126.2</u></u>	<u><u>154.2</u></u>	<u><u>207.6</u></u>	<u><u>686.4</u></u>

Source: IBRD, August 1977

TABLE 5

(Annex D)  
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SOCIAL ANALYSIS

1. Project Beneficiaries

Income Levels

The project beneficiaries will be the residents of those villages to be connected with the national electric grid under the project. In accord with the SARG, World Bank and USAID decision to connect groups of villages with the grid in the order of their rates of return from receiving electric power through the grid, a large portion of the beneficiaries in this first phase of EPE's rural electrification program will be residents of the Damascus and central regions (Homs, Hama) of Syria, where the rates of return from electrification were found to be highest by SOFRELEC. About one million people live in the area to be covered by the project.

According to estimates by SOFRELEC of family income in the various regions (see following table), average family income in the Damascus region is (L.S. 18,500) and in the central region \$4,165 (L.S. 16,450).

Annual Income of Rural Families<sup>1</sup>

<u>Region</u>	<u>Average per family (in U.S. dollar)</u>
Damascus	\$ 4,683
Central Region	4,164
Coastal Region	5,063
Northern Region	5,822
Eastern Region	4,556
Southern Region	2,000

<sup>1</sup>Derived from SOFRELEC study on rural electrification, 1977, Income data adjusted by SOFRELEC for consumption of income in kind.

Assuming 6 persons per family, the annual per capita income in the proposed project area is about \$737, as compared to \$648 for all of Syria.

2. An Average Village in the Project Area

From 1970 census data gathered by the Syrian Central Bureau of Statistics, the SOFRELEC study derived a profile of the socio-economic characteristics of the average village to be included in the project.

A village of 1,000 inhabitants would have a school, a mosque or church and possibly one or two other public agencies, such as a post office, police station, medical care center, municipal office, army installation, a railroad station, a customs office, or a food cooperative outlet. There would also probably be two or three privately-owned general stores. Local industries would most likely include a gas station (government-owned) and poultry hatchery, either government or privately owned. Most of the hatcheries in non-electrified villages now operate on batteries or are supplied with electricity by diesel generators. In addition there might be a manually operated rug factory (probably government-owned) and minor artisanal production, as well as such small industrial units as flour mills, olive and wine presses, and bread makers. For villages of less than 1,000

only this latter group of small industrial units is likely to be found. The SOFRELEC study excluded villages less than 100 inhabitants.

Within the villages most houses are of concrete or cement, and are clustered in groups except along the banks of the Euphrates River where houses are more spread out. Ordinarily one or two families with an average of six people per family inhabit each house.

3. Public Sector and Private Electricity Consumption

In rural areas already electrified, SOFRELEC data show that about 75% of electric power is consumed by private residential and commercial users. The balance of 25% is consumed by the public sector for lighting and the various governmental organizations noted above.

Data gathered by SOFRELEC for a three year period show that in villages already connected to the grid, electricity consumption by the public sector has declined slightly in comparison with consumption by private users, and is expected to stabilize at about 19% of total electricity consumption are likely to be in the private sector as rural areas are connected to the national grid.

4. Role of Women

While all village inhabitants will enjoy an

improved quality of life when electric power becomes generally available after connection to the grid, women will enjoy particular benefits because of the greatly enhanced possibility of using labor-saving household equipment. Very little non-electric household equipment is available in Syria e.g. no gas refrigerators, etc., so most household work is done by traditional manual methods, without benefit of washing machines, electric irons, refrigerators, etc. When electricity is available, use of such appliances increases significantly, as the following table indicates:

<u>Appliance</u>	<u>Percentage of Subscribers to Electrical System owning appliance</u>	
	<u>Electrified Villages</u>	<u>Damascus Region</u>
Refrigerator	26%	40%
Washing Machine	18%	30%
Iron for Pressing	66%	
Stove	11%	45%

With the increased availability of electricity in rural households, women will be able to perform their house work more easily and quickly, as well as benefit from the general improvement in living conditions through better lighting.

5. Social Impact

The primary project benefit will be an improvement in the quality of life in villages, both directly for those individuals living in homes that are electrified and indirectly through public street lighting, improved storage of perishables at local stores, social services, community television receivers, and similar items of public consumption. These benefits are largely non-quantifiable except in terms of payment for electricity used.

In other countries, rural electrification programs have resulted in improvements in village water supplies (through the installation of electric pumps), better health services (improved lighting and refrigeration in rural clinics), and increased access and use of educational facilities (lighting in classrooms). It is assumed that similar changes will occur as a result of the proposed Project. Most villages to be electrified in Phase I are relatively close to urban centers and therefore changes introduced by improved access to electric power are not expected to result in significant and measurable changes in the cultural environment.

Availability of reliable electric power may encourage growth of rural employment through the expansion of small scale industry. Other income-related changes such as increased agricultural production due to the introduction of electricity on farms may also occur overtime. These changes, however, are dependent on a number of other factors outside the framework of the Project. For that reason, income-related changes are goal-level rather than purpose-level indicators of project success and are not considered significant modifications in the socio-economic environment which can be directly attributed to the Project.

## ANNEX F

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: 5 years  
 From FY 1977 to FY 1982  
 Total U.S. Funding \$34.7 Million  
 Date Prepared: June 1977

Project Title &amp; Number: Syria

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:            Improve rural living conditions through providing basic services, creating new employment and income earning possibilities and enhancing rural agricultural production.</p>	<p>Measures of Goal Achievement:            1. Average rural family real incomes in electrification areas will increase.            2. Residents of areas realizing incomes from jobs that did not exist before electricity became available.            3. Population in area having ready access to social services not available before electricity became available.            4. Population of electrically powered farm machinery and equipment in the project area will increase.</p>	<p>Census statistics, EPE, and other studies.</p>	<p>Assumptions for achieving goal targets:            1. That available electric power will encourage small-scale or ancillary industry to be started up or relocate in rural areas.            2. That an absence of reliable energy is an inhibiting factor in allocation of public as well as private resources.</p>
<p>Project Purpose:            Make reliable electric power available to the population of the project area at reasonable rates.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.            1. Electric power available 24 hours a day to population of villages in project areas.            2. All connected households having electric light and a majority having at least one labor-saving electric appliance.            3. Approx. 50% of the households in the project area will be connected to the power distribution system.</p>	<p>EPE records. Engineering consultant's final report and project site inspections.</p>	<p>Assumptions for achieving purpose:            1. EPE system will be adequately managed and maintained.            2. Power will be available to meet new demand.            3. Rural village population will have sufficient disposable income to purchase electricity.            4. High and medium tension distribution lines and substations will be in place when needed.</p>
<p>Outputs:            Construction of a low and medium voltage distribution system linking approximately 1200 villages to the national central station power network by 1981.</p>	<p>Magnitude of Outputs:            1. Installation of approximately 3,000 Ki of 380-220 volt secondary lines.            2. Installation of street lighting in approximately 1200 villages.            3. Installation of approximately 2,000 KM of 20 KV distribution lines, including 70 MVA of distribution transformer capacity.</p>	<p>Central Bureau of census data, EPE records, independent expert judgment, project evaluation, project evaluation. Reports submitted by EPE, the engineering consultant, and USAID site inspections.</p>	<p>Assumptions for achieving outputs:            1. That SARG and AID priorities will result in continued support of the project and program.            2. Inputs to be provided by other donors, will be available in a timely basis.</p>
<p>Inputs:            U.S.            A.I.D.: FY 77 Loan for \$34.7 million to install low tension (380/220 volt) system for commodities, for consulting engineering services.            SARG: \$62 million to cover costs of locally procured personnel, and commodities, and construction.            IBRD: FY 78 Loan of \$40 million for commodities for 20 KV and 338-220 volt lines, and 70,000 KVA of transformer capacity.</p>	<p>Implementation Target (Type and Quantity)            See Annex B for the financial plan of the Project.</p>	<p>Central Bureau of Census, EPE, SARG, AID records and documentation.            EPE and engineering consultant reports; site inspections.</p>	<p>Assumptions for providing inputs:            That SARG and AID priorities will result in continued support of the project and program.</p>



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SYRIA - RURAL ELECTRIFICATION  
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6C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Security Supporting Assistance funds.

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

GENERAL CRITERIA FOR PROJECT.

1. App. Unnumbered; FAA Sec. 653(b)
  - (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project;
  - (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure plus 10%)?

(a) The project is contained in FY 77 Congressional Presentation.  
(b) Yes.
2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

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

No further legislative action in required.
4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)?

Not applicable.
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?

Yes.

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A.

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multi-lateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans to the maximum extent appropriate?

No. Syria is not a newly independent country.

7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

Through provision of electricity to rural villages, the project will have some of the effects indicated in (e).

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

Apart from providing financing for use of American engineering consultant firm, the project will have little effect on U.S. investment and trade.

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

The Project Agreement will so provide.

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

Syria is not an excess currency country.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

Not applicable.

B1

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: [include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]

N.A.

- (1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;
- (2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor;
- (3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;
- (4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:
  - (a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;
  - (b) to help alleviate energy problem;
  - (c) research into, and evaluation of, economic development processes and techniques;
  - (d) reconstruction after natural or manmade disaster;
  - (e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;
  - (f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

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(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries. N.A.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)? N.A.

d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing? N.A.

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy. N.A.

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

B1

g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

N.A.

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

N.A.

2. Development Assistance Project Criteria (Loans only)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

N.A.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

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B2

e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

3. Project Criteria Solely for Security Supporting Assistance

FAA Sec. 531. How will this assistance support promote economic or political stability?

4. Additional Criteria for Alliance for Progress

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

Provision of electricity to rural Syria is an essential step toward country-wide economic development. Such development is a precondition to Syria's political stability.

N.A.

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SYRIA - RURAL ELECTRIFICATION  
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6C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by exclusion (as where certain uses of funds are permitted, but other uses not).

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed? Yes. Small business will participate in accordance with A.I.D. procurement regulations.
2. FAA Sec. 604(a). Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him? Yes.
3. FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed? Syria does not so discriminate.
4. FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? N.A.
5. FAA Sec. 608(a). Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items? Yes. Although few, if any, instances of utilization of excess property are expected.
6. WMA Sec. 901(b). (a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. Yes.
7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized, Yes.  
N.A.

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are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

B. International Air Transport: Fair Competitive Practices Act, 1974

If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?

Yes.

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?

Yes.

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

Yes.

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million?

N.A.

C. Other Restrictions

1. FAA Sec. 201(d). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

N.A.

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

N.A.

3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-Bloc countries, contrary to the best interests of the U.S.?

Yes.

4. FAA Sec. 436(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S. or guaranty of such transaction?

Yes.

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5. Will arrangements preclude use of financing:

a. FAA Sec. 114. to pay for performance of abortions or to motivate or coerce persons to practice abortions?

Yes.

b. FAA Sec. 620(j). to compensate owners for expropriated nationalized property?

Yes.

c. FAA Sec. 661. to finance police training or other law enforcement assistance, except for narcotics programs?

Yes.

d. FAA Sec. 662. for CIA activities?

Yes.

e. App. Sec. 103. to pay pensions, etc., for military personnel?

Yes.

f. App. Sec. 106. to pay U.N. assessments?

Yes.

g. App. Sec. 107. to carry out provisions of FAA Sections 209(d) and 251(h)? (transfer to multilateral organization for lending).

Yes.

h. App. Sec. 501. to be used for publicity or propaganda purposes within U.S. not authorized by Congress?

Yes.



EMBASSY OF THE  
UNITED STATES OF AMERICA  
AGENCY FOR INTERNATIONAL DEVELOPMENT

ANNEX I

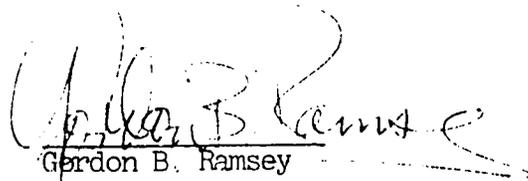
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CERTIFICATION PURSUANT TO SECTION 611 (c) OF THE  
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

RURAL ELECTRIFICATION

I, Gordon B. Ramsey, the principal officer of the Agency for International Development in Syria, having taken into account, among other things, the maintenance and utilization of projects in Syria previously financed or assisted by the United States, do hereby certify that in my judgement Syria has both the financial capability and the human resources capability to effectively maintain and utilize the capital assistance project Rural Electrification.

This judgement is based on general considerations discussed in the project paper to which this certification is attached.

  
Gordon B. Ramsey  
AID Director

DEPARTMENT OF STATE  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON

THE ADMINISTRATOR

PROJECT AUTHORIZATION  
AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Country: Syria                      Name of Project: Rural Electrification  
Number of Project: 276-0018

Pursuant to Part II, Chapter 4, Section 532 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Loan to Syria (the "Cooperating Country") of not to exceed Thirty-four Million Seven Hundred Thousand United States Dollars (\$34,700,000) (the "Authorized Amount") to help in financing the foreign exchange costs of goods and services required for the project as described in the following paragraph.

The project consists of providing the equipment and materials for the installation of the low-tension distribution system and the overall engineering services of Phase I of the Syrian Rural Electrification Program (hereinafter referred to as the "Project").

The entire amount of the A.I.D. financing herein authorized for the project will be obligated when the Project Agreement is executed.

I hereby authorize the initiation and negotiation of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following terms and covenants and major conditions as A.I.D. may deem appropriate:

a. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to A.I.D. in United States Dollars within forty (40) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in United States Dollars interest from the date of first disbursement of the Loan at the rate of (a) two percent (2%) per annum during the first ten (10) years, and three percent (3%) per annum thereafter, on the outstanding balance of the Loan and on any due and unpaid interest accrued thereon.

- 2 -

b. Source and Origin of Goods

Goods and services financed by A.I.D. under the project shall have their source and origin in the United States, except as A.I.D. may otherwise agree in writing.

c. Initial Conditions Precedent

Except as A.I.D. may otherwise agree in writing, prior to any disbursement, or the issuance of any commitment documents under the Project Agreement, the Cooperating Country shall furnish in form and substance satisfactory to A.I.D.:

- 1) An executed contract for the Project, acceptable to A.I.D. for engineering services; and
- 2) An executed agreement with the Establishment Public d'Electricite (EPE), acceptable to A.I.D., making the proceeds of the Loan available to EPE.

d. Additional Conditions Precedent

Except as A.I.D. may otherwise agree in writing, prior to any disbursement or the issuance of any commitment documents under the Project Agreement to finance equipment and materials for the low-tension distribution system, the Cooperating Country shall furnish in form and substance acceptable to A.I.D., an executed effective loan agreement between the International Bank for Reconstruction and Development and the Cooperating Country (or EPE) to provide foreign exchange for the medium tension and other integral components of the power distribution system.

\_\_\_\_\_  
John J. Gilligan

\_\_\_\_\_  
Date

SYRIA RURAL ELECTRIFICATION  
A. EXISTING TARIFFS

DOMESTIC, GENERAL LIGHTING, SMALL COMMERCIAL

Outlying Systems

Piasters/kWh

- Latakia, Tartous, ElBab, Massiaf, Deir-ez-Zor
- Banias
- All others
- Government, Municipalities, Army, discount 10%

22  
20  
24

Interconnected System

	<u>Piasters</u>			
	<u>General</u>	<u>Municipality</u>	<u>Government</u>	<u>Army</u>
- Damascus	19	13.5	17	16
- Aleppo	19	Changes yearly with actual costs	19	19
- Homs	19	16	16	16
- Hama	19	16	16	16

STREETLIGHTING

Piasters/kWh

Outlying Systems

- All

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Interconnected System

- Damascus - 300,000 kWh yearly
- next 350,000 kWh monthly
- all excess kWh monthly
- Aleppo: Changes yearly with actual costs
- Homs
- Hama

gratis  
13.5  
12  
-  
7  
7

SMALL INDUSTRIES

Outlying Systems

Piasters/kWh

- | <u>kWh</u>                | <u>(10 kW)</u> | <u>10 kW</u> | <u>ALL</u> |
|---------------------------|----------------|--------------|------------|
| 1-250 LT; 1-500 HT        | 19             | 16           | 14         |
| 251-500LT; 501-1000 HT    | 16             | 13           | 11         |
| over 500 LT; over 1000 HT | 14             | 11           | 8          |
| If meters provided:       |                |              |            |
| - peak time               |                | 24           | 15         |
| - day time                |                | 16           | 11         |
| - night time              |                | 10           | 7          |

Government and Army discount 10%

Interconnected System

1 - 1,000	17	16
1,001 - 4,000	15	14
4,001 - 10,000	13	12
10,001 - 100,000	11	10
100,001 - 500,000	10	9
500,001 and above	9	8

Source: IBRD, August 1977

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LARGE INDUSTRIES (5.5 kV; 20 kV)

utilizing Systems see Small Industries

interconnected System

The variations between the various contracts is so great that a tabulation would indicate little, except the extreme diversity; kWh charges range as follows:

	<u>Piasters/kWh</u>	
	<u>Minimum</u>	<u>Maximum</u>
Damascus	5.5	22.0
Leppo	6.6	15.6
Homs and Hama	3.0	5.0

HEAVY INDUSTRIES (66 kV; 230 kV)

Supply from:

Type of Operation

peak time

day time

night time

	<u>Piasters/kWh</u>					
	<u>P.S. Busbars</u>		<u>20 kV</u>		<u>66 kV</u>	
	<u>Normal</u>	<u>Continuous</u>	<u>Normal</u>	<u>Continuous</u>	<u>Normal</u>	<u>Continuous</u>
peak time	10	5	11	5.5	13	6.6
day time	5	5	5.5	5.5	6.6	6.6
night time	3.5	5	2.8	5.5	3.3	6.6

ARMY AND GOVERNMENT, POWER

Damascus

Army and Government

Leppo

Government

Army

Piasters/kWh

13

15

13

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR, BUREAU FOR NEAR EAST

TO: GC/NE, Robert G. Meighan

Problem: To decide that certain A.I.D. projects in Syria do not promote or assist bloc projects or activities.

Discussion: USAID/Damascus has informed AID/W that there are several A.I.D. projects in Syria where commingling may exist (TAB A).

Under Agency policy (Tab B) where it is not clear that an A.I.D. project does or does not promote or assist bloc projects or activities, the final decision is to be made by the Regional Assistant Administrator acting in consultation with General Counsel.

Your decision is needed on the following two A.I.D. activities in Syria:

(a) Rural Electrification (Proposed FY 77 funding - \$18.0 million)

Bloc activities in the SARG Rural Electrification Program include design, hardware and construction of transmission lines to various centers from which rural systems will pull power, including rural systems to receive A.I.D. assistance.

It is my opinion that the project would not be commingling. A.I.D. policy states that for commingling to exist, the A.I.D. assistance must come directly into a bloc project. In this instance, the A.I.D. activity is a discrete activity separate from the bloc activity involving transmission lines. In addition, with the bloc transmission lines feeding A.I.D.-financed rural electric systems, the bloc activity is assisting the A.I.D. project, rather than vice-versa.

(b) Euphrates Irrigation Maintenance (FY 76 Loan and proposed FY 77 Amendment - \$17.0 million and \$5.0 million respectively).

Under this project A.I.D. is financing the establishment of repair/maintenance shops which will be used to repair and maintain equipment implementing reclamation projects in the Euphrates Region. Some of those projects are bloc assisted.

