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DEPARTMENT OF STATE  
BUREAU OF INTERNATIONAL DEVELOPMENT  
WASHINGTON, D.C. 20522

PROJECT PAPER

492-321

Proposal and Recommendations  
For the Review of the  
Development Loan Committee

PHILIPPINES - RURAL ELECTRIFICATION V

AID-010/P-2275

UNCLASSIFIED

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

UNCLASSIFIED

AID-DLC/P-2275

November 21, 1977

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Philippines - Rural Electrification V

Attached for your review is the recommendation for authorization of a loan to the Government of the Philippines (the "Cooperating Country") through the National Economic and Development Authority "Borrower" for the National Electrification Administration "Beneficiary" of not to exceed Eight Million Four Hundred Thousand United States Dollars (\$8,400,000) (the "Authorized Amount") to help in financing certain foreign exchange costs of goods required for the Project.

This loan is scheduled for consideration by the Development Loan Staff Committee on ~~Monday, November 28, 1977~~, *Fri., Dec 2,* at 2:30 p.m., in Room 3886 New State. If you are a voting member a poll sheet has been enclosed for your response.

Development Loan Committee  
Office of Development Program  
Review

Attachments:

Summary and Recommendations  
Project Analysis  
Annexes A - K

UNCLASSIFIED

# RURAL ELECTRIFICATION V

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**PART I**

**SUMMARY AND RECOMMENDATIONS**

AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT PAPER FACESHEET</b>		1. TRANSACTION CODE <div style="border: 1px solid black; display: inline-block; padding: 2px;">A</div> A - ADD C - CHANGE D - DELETE		PP 2. DOCUMENT CODE 3
3. COUNTRY/ENTITY Philippines		4. DOCUMENT REVISION NUMBER <input type="checkbox"/>		
5. PROJECT NUMBER (7 digits) <div style="border: 1px solid black; display: inline-block; padding: 2px;">492-0321</div>		6. BUREAU/OFFICE A. SYMBOL ASLA      B. CODE <div style="border: 1px solid black; display: inline-block; padding: 2px;">04</div>		7. PROJECT TITLE (Maximum 40 characters) <div style="border: 1px solid black; display: inline-block; padding: 2px;">Rural Electrification V</div>
8. ESTIMATED FY OF PROJECT COMPLETION FY <div style="border: 1px solid black; display: inline-block; padding: 2px;">80</div>		9. ESTIMATED DATE OF OBLIGATION A. INITIAL FY <div style="border: 1px solid black; display: inline-block; padding: 2px;">78</div> B. QUARTER <div style="border: 1px solid black; display: inline-block; padding: 2px;">1</div> C. FINAL FY <div style="border: 1px solid black; display: inline-block; padding: 2px;">79</div> (Enter 1, 2, 3, or 4)		

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$1 - 7.5)

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. F.A.	C. L.C.	D. TOTAL	E. F.X.	F. L.F.C.	G. TOTAL
AID APPROPRIATED TOTAL	8,400		8,400	8,400		8,400
(IGRANT)						
(LOAN)	8,400		8,400	8,400		8,400
OTHER 1.						
U.S. 2.						
HOST COUNTRY		33,300	33,300		110,000	110,000
OTHER DONOR(S)						
TOTALS		33,300	41,700	8,400	110,000	118,400

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY <u>78</u>		H. 2ND FY		K. 3RD FY	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	B 201	-	062	-	8,400	-	-	-	-
(2)									
(3)									
(4)									
TOTALS					8,400	-	-	-	-

A. APPROPRIATION	N. 4TH FY		Q. 5TH FY		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED  MM   YY <div style="border: 1px solid black; display: inline-block; padding: 2px;">06   78</div>
	O. GRANT	P. LOAN	H. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1)						8,400	
(2)							
(3)							
(4)							
TOTALS	-	-	-	-	-	8,400	

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 8, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1

 1. NO  
2. YES

14. ORIGINATING OFFICE CLEARANCE		15. DATE DOCUMENT RECEIVED IN AID/W. OR FOR AID W/ DOCUMENTS, DATE OF DISTRIBUTION	
SIGNATURE		MM   DD   YY <div style="border: 1px solid black; display: inline-block; padding: 2px;">06   06   77</div>	
TITLE Richard M. Dangler Assistant Director for Capital Development			

## B. RECOMMENDATIONS

It is recommended that a loan be authorized for \$ 8,400,000 with the following proposed terms:

1. Maturity: twenty years including a ten-year grace period.
2. Interest: two percent per annum during the grace period and three percent per annum thereafter.
3. Currency: interest and principal repayable in U. S. dollars.

No waivers are being sought.

## C. DESCRIPTION OF THE PROJECT

### 1. Project Activities

This loan is to provide a \$8.4 million line of credit to be used by the National Electrification Administration (NEA) to finance imports of electrical distribution equipment and materials (mostly from the United States, but some from AID Geographic Code 941 countries). These imported materials will be used, together with locally available materials and labor funded by the NEA, to continue implementation of a nationwide rural electrification program. The individual systems will be owned and operated by Rural Electrification Cooperatives (patterned after the United States Rural Electrification Cooperatives).

While the long-range objective of the Government of the Philippines (GOP) is electrification of the entire country by 1990, program implementation by NEA has concentrated on the attainment of its immediate objectives - the establishment of at least one electric cooperative in every province by the end of 1977 and the completion of a "backbone" system electrically linking all municipalities (equivalent to U. S. counties) in each cooperative area by 1980. The intensity of program momentum has been such that these targets will be met and some may be surpassed. The NEA will have established at least one electric cooperative in every province by 1977 (with the exception of several small island subprovinces). Even now there are a number of provinces with more than one electric cooperative. By the end of May 1977, 82 electric cooperatives had been organized of which 62 were partially or wholly energized. Furthermore, over 450 municipalities and 4,600 villages have been energized. There are 520,000 households, representing approximately 3 million people, now receiving electricity through rural electric cooperatives.

The \$84 million AID loan will be utilized to finance the procurement and importation into the Philippines of the following general schedule of materials for the rural electrification program:

Conductor	\$ 8,400,000
<hr/>	
Total	\$ 8,400,000 <sup>1/</sup>

## 2. Project Implementation Responsibilities

The implementing agency for the overall project will be the National Electrification Administration which was established in 1969 under the provisions of Republic Act No. 6038 and reorganized and expanded in accordance with Presidential Decree No. 269 dated 6 August 1973.

The sub-borrowers of NEA, and individual implementing agencies, will be the various rural electric cooperatives throughout the country. Each of these cooperatives is a non-stock, non-profit, membership cooperative organized for the sole and specific purpose of supplying electric service on an area coverage basis. Most of these electric cooperatives are registered under the provisions of Chapter III of Presidential Decree No. 269, although some are conversions of systems established under earlier Acts.

## 3. Project Linkages

AID will provide dollar financing for certain imported commodities procured for this project. The GOP will finance all in-country project costs. The primary goal of this project is to

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<sup>1/</sup> These figures are based upon the best cost data available at the time of preparation. Adjustments within categories is permitted provided the total is not exceeded.

improve the standard of living for the rural poor who constitute the low income majority of Philippine society. Together with the electric cooperatives, NEA has actively developed and supported projects such as the Barangay (small village) Irrigators' Service Associations, small and medium scale industrial cooperatives, electrification of rural public schools, village water supply (potable) systems, and the Fishermen's Service Association project.

The Barangay Irrigator's Service Association project, as well as the small and medium scale industrial cooperatives project, have both been described and elaborated upon in previous loan papers and need not be repeated here.<sup>1/</sup> An NEA electrification of public schools project is designed to bring the benefits of electrification to the numerous rural public schools throughout the country. Electrification of public schools is expected to result in the increased utilization of existing school buildings, the introduction of night classes for adult and out-of-school youth education, and an increase in vocational and technical training with the use of electrically powered machinery and equipment. As of April 1977, NEA had already energized, through this program, 617 schools with a total of 4,085 schoolrooms.

The Fishermen's Service Association program was created in early 1977 by NEA and is designed to provide financial and technical assistance to small independent fishermen who organize into cooperatives or associations to own and operate ice plants and cold storage facilities. The project is aimed at one of the country's lowest income sectors, fishermen, and will assist them greatly in their trade. Lack of ice plants and cold storage facilities has kept many fishermen from increasing their volume of business, and has made them dependent on commercial merchants and middlemen.

In NEA's village water supply systems project, NEA, through the electric cooperatives, provides financial and technical assistance to villagers who form associations to own and operate potable water systems. The systems are rather simple, consisting mainly of an electric driven water pump, small reservoir, distribution and public standpipes. This project enables the villagers to enjoy the benefits of having potable drinking water in their communities; there are no house connections in these systems with water being provided to the

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<sup>1/</sup>See Project Paper RE IV, page 24 and Capital Assistance Paper for Small Scale Irrigation for more details.

community through public standpipes. In each of the pilot projects the incidence of gastro-intestinal diseases has been drastically reduced; particularly among the young.

All these above projects have the features of increasing the load and enhancing the viability of the electric cooperatives, as well as improving the standard of living of the rural poor. This is not to say, however, that such projects and beneficial effects of electrification arise only through the active involvement of NEA and the cooperatives. Most of the beneficial spin-offs have arisen through the introduction of reliable electric power at rates that are affordable to rural poor. The availability of electricity encourages the formation of entities that will result in increased productivity in both agricultural and industrial enterprises, thus increasing wealth and incomes in rural areas. As incomes increase and become more equitably distributed, many social services that are now limited or unavailable in rural areas (doctors, nurses, public health programs, education, cultural programs, entertainment, etc.) become available.

#### 4. End of Project Status

The successful execution of this project will result in construction of over 4,000 kilometers of 13.8 KV primary line ("backbone") and the necessary secondary distribution systems needed to bring electric service to at least 1.2 million more rural dwellers.

#### D. SUMMARY FINDINGS

The Philippine Rural Electrification Program is presently on schedule. Electrical connections by the end of 1977 will exceed 700,000 households, directly serving more than 4,200,000 people. Cooperatives have been organized in all but a few small island sub-provinces in the Philippines. To date 82 cooperatives have been organized, 62 have electrical service and 8 additional cooperatives will have operating systems by the end of CY 1977. If financing can be arranged for commodities as planned all provinces in the Philippines will be electrified by 1980. Direct project beneficiaries will be between 12-13 million people by 1980 and perhaps two to three times that many people indirectly. The RE Program is an enormous undertaking which will have momentous impact on the Philippines.

Technical, financial, social and economic analyses are presented in the body of this Project Paper. The project has been evaluated from numerous viewpoints, and is judged sound and suitable for AID financing.

Furthermore, previous AID loans have provided the opportunity to establish implementation plans and develop project cost estimates which together have resulted in a high degree of accuracy and implementation of the project as scheduled.

The administrative capabilities of the NEA are well developed. Internal evaluation of program operations are routine. Special evaluations, such as project NELCOR (see evaluation section) on beneficiaries and other specific topics of interest to NEA administrators, are planned and carried out on a routine basis.

The need for financial assistance from multilateral and from international lending institutions for this program has been recognized and thoroughly reviewed. Assistance from both the IBRD and ADB has been sought as early as 1975 as a follow-on to AID's RE IV loan (contacting the IBRD and the ADB was a CP to AID's RE IV loan). The IBRD recently conducted a pre-appraisal review and Bank officials report that there are good prospects for an IBRD loan by mid-1978. ADB financing is scheduled to follow in 1979.

The consequences to the overall effectiveness of RE Program, if AID bridge financing is not received, are enormous and may compromise the effectiveness of the entire RE Program.

The project meets all applicable analyses criteria. The project is directly and indirectly impacting on the rural poor. A Statutory Checklist is attached in Annex F, and the Mission Director's 611 (e) Certification is attached as Annex G.

#### E. PROJECT ISSUES

1. Issue: Should AID make a fifth Philippine Rural Electrification loan to provide interim financing pending availability of IBRD funds?

The fifth project funding proposal for rural electrification program is made with the full understanding of the concern expressed by the Senate Appropriations Committee (SAC) over "large scale infrastructure projects that require massive amounts of financial assistances" and the SAC recommendation that "projects of this nature be funded by international funding institutions ...<sup>1/</sup> The

<sup>1/</sup> Senate Appropriations Committee 1975 hearings on Foreign Assistance and Related Programs Appropriation Bill.

Mission also understands that the previous rural electrification project (492-T-043) was presented to Congress as the final project assistance to the Philippine Rural Electrification (RE) Program.

Last year when Loan 492-T-043 was authorized, AID recognized that the Philippine RE Program had demonstrated sufficient internal growth and maturity to attract international development bank funding. As an AID condition precedent to the previous loan, NEA was required to approach both the International Bank for Reconstruction and Development (IBRD) and the Asian Development Bank (ADB) for program requirements beyond 1978. Thus on March 31, 1976, the GOP applied for a \$25 million loan from both the IBRD and the ADB. Both banks responded favorably with the IBRD planning to provide assistance by the Fall of 1977 and the ADB by FY 1979 or 1980.

Therefore, with such assurances received by NEA, AID felt comfortable with phasing out its operations with Loan RE IV (all L/Coms issued by April 1978 - see project Performance Network, RE IV PP). However, two things happened which forces NEA and AID to reevaluate these plans:

a. The successful Philippine RE program has moved with such speed and assurance, that NEA now anticipates to fully utilize all AID funds by August 1977 - eight months ahead of schedule.

b. The IBRD project appraisal loan negotiations have slipped six to eight months with loan signing now anticipated about September 1978. (The Bank officials have stated that the earliest signing could not be completed prior to April - May 1978).

These two factors have created a funding gap equivalent to 15 months of operations.

Therefore, the fifth AID rural electrification project loan is proposed despite the Congressional concerns because the consequences of not providing interim funding are too serious and detrimental to the overall RE Program to ignore. Analyses presented in this Project Paper will explain the "funding gap" between the AID loan and proposed IBRD-ADB funding and will also describe how, if funding is not available, serious and perhaps irreparable damage will ripple throughout the entire program. This resultant

effect will compromise AID's program emphasis of reaching the rural poor with jobs and a better quality of life, thereby diminishing the NEA's credibility toward the electrification program. The lack of funding will also manifest itself in diminished enthusiasm for the program and reduced effectiveness. If, due to inadequate funding, NEA is not able to maintain its current level of activity qualified NEA technical and contractor personnel, trained over the last 5 years and now fully capable of running the program may be released and perhaps lost to the program entirely.

A final consequence is the possibility that the AID program beneficiary concepts, integrated into this program may be lost, and also as a result of diminished program activities and hence capabilities the risk of not securing follow-on IBRD and ADB funding is increased.

2. Issue: Is FAA Section 103 the proper funding category for Rural Electrification?

Congressional concern has also been focused on the suitability of funding rural electrification projects from Section 103 Food and Nutrition category of the FAA.

USAID believes that category 103 funding for the Philippine Rural Electrification Program is appropriate and compatible with the FAA legislation and Congressional intent. The Philippine Rural Electrification Program provides "basic services" through rural electric cooperatives to enhance the rural poor capacity for self-help as provided for in FAA Section 103. In July 1973, the Committee on Foreign Affairs, chaired by Representative Morgan, gave the following definition of Section 103: "Rural Development must aim at . . . improving the quality of life in rural areas . . . to slow the rural-urban migration . . . (through) the encouragement of local institutions which can foster participation by the general populace. To meet these objectives, rural development funds . . . should be concentrated in the following areas: . . . Local infrastructure and utilities . . . rural electrification . . ." <sup>1/</sup>

The Philippine RE Program also creates employment opportunities for rural farm workers and isolated fishermen (perhaps the poorest of the poor group in the Philippines); through more intensive agricultural activity stimulated by the availability of

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<sup>1/</sup>House Report No. 93-388, 93d Congress, 1st Session, pg. 20.

electrically driven agricultural equipment such as water pumps, rice mills, and other agricultural tools and the manufacture of ice so that fish can be stored, losses reduced and higher prices received. RE also stimulates industrial activity in the rural areas providing jobs for the rural unemployed and underemployed. Additionally the Foreign Assistance Act does appear to consider rural electrification an appropriate funding activity. The legislation on Foreign Relations states under Section 103 (c) that Assistance provided under this section "shall be used primarily for activities which are specifically designed to increase the productivity and income of the rural poor, through such means as . . . expansion of local or small scale rural infrastructure and utilities such as . . . energy . . ." <sup>1/</sup>

The Senate Appropriations Committee (SAC) has recommended that Section 103 funds be used directly for food production. The Committee recommends that assistance "demonstrate a straight forward and calculable relationship between the funding assistance and the provision of food for hungry people . . . (by focusing) on the provision of 'basic services' which enhance the 'capacity for self-help' among the poor of the developing world". <sup>2/</sup> The Committee further stated that they were way of AID's approach to rural infrastructure and questioned the meaning of "small scale". During the SAC hearings on the FY 78 AID program it was noted that the Committee did "not consider \$10 million to be small" during discussions with Mr. Nooter regarding the proposed Honduras electrification loan. Indeed in this context the request for \$20 million would also not appear small until there was a clear understanding of the Philippine RE Program. It is a massive endeavor to bring safe, reliable, cheap power to the entire rural area by 1990 with all villages being served by 1984. However, this will be accomplished through development of 120-150 locally-owned and operated cooperatives. At start-up each cooperative is small, in many cases serving only a few households. The households themselves are small, as evidenced by the fact that initially 50 to 70 percent of the households do not use the minimum 15 KW-hours/month of power (equivalent to about US \$0.60) because they can only afford one or two light bulbs. However, the dynamic growth of each cooperative shows not only a rapid development of household connections but also a substantial growth in small and medium scale industries (welding shops, handicrafts, box makers for agricultural products, small agricultural tools, etc.). These industries create jobs, which

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<sup>1/</sup>Legislation on Foreign Relations (April 1976), Joint Committee Print, 94th Congress, 2d Session, pp. 14-15.

<sup>2/</sup>Senate Report No. 94-1009, 94th Congress, 2d Session, p. 35.

provide the non-farm worker the money to buy food and therefore helps establish the agricultural market which gives the farmer an incentive to grow more food. Therefore, USAID believes this project is correctly funded under Section 103 in that it:

1. has a direct impact on food production
2. improves quality of life
3. fits within the framework of "rural development"
4. leads to employment generation which assures the farmer a market and indirectly impacts on food production.

PART II

PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. PROJECT BACKGROUND

The GOP is presently engaged in a series of programs designed to strengthen and expand the country's infrastructure and rural development. The Four-Year Development Plan, FY 1974-77 is to be replaced by a new Five-Year Plan, from 1978 to 1982. This new Plan focuses on projects that boost agricultural production and rural incomes; projects that will catalyze industrial expansion and dispersal; and projects that will provide immediate and widespread socio-economic relief to the greatest number of people, with special attention to the needs of depressed social groups and geographical regions. The rural electrification program, through the establishment of rural electric cooperatives in every province, plays a key role in the implementation of the Plan. Specifically, the revised plan indicates that rural electrification is to support an increase in agricultural and industrial productivity, a regional dispersion of investment and employment opportunities, and an improvement of living standards in rural and urban areas.

At the October 1975 meeting of the Consultative Group for the Philippines, Secretary of Finance Virata read a message from President Marcos which stressed the retention of rural and agricultural development as major goals of the GOP. Secretary Virata then delivered the opening statement in which he said 25 percent of domestic expenditures will be devoted to rural development, and that the GOP will continue its high level of investment in rural electrification. At the conclusion of the meeting, the members present congratulated the GOP on its achievements and noted that in spite of recent international events the GOP has continued to pursue a sound long-term development strategy. They also agreed that it was appropriate for the GOP to obtain new commitments of concessional assistance to carry out its programs.

The Development Assistance Program (DAP) for the Philippines (Revision 1 - June 1975, Two Volumes) underscores the need for concessional assistance, and states that complex "people-intensive" programs in areas such as population/family planning, agrarian reform, rural industry and infrastructure, and those that emphasize broadened participation in the process of development are the ones that bilateral assistance should be channeled into. The DAP goes on to state that rural electrification "introduces immediate and tangible benefits to numerous rural dwellers and functions as essential infrastructure for the growth and development of small and medium scale industries", and that the "rural electrification effort which AID is assisting is one of the Government's highest priority programs".

AID's interest in rural electrification in the Philippines began with the financing of the "National Electric Power Industry Survey" in 1965. That survey resulted in the fielding of a team from the National Rural Electric Cooperative Association (NRECA) to survey possible sites for the establishment of two pilot rural electric cooperative projects, and two sites were selected for full feasibility studies. Upon acceptance of the feasibility studies, the GOP acting through the Electrification Administration, established by Republic Act No. 6038 in 1969, and with the assistance of two AID loans totaling \$3.4 million built cooperatives in Negros Occidental (VRESCO) and Misamis Oriental (MORESCO). With the success of these projects behind them, the GOP in 1972 launched into a nationwide rural electrification program similar to that mounted successfully in rural America in the 1930's. AID has granted seven loans totaling \$81.4 million, the status of which is as follows as of April, 1977:

Table 1  
Summary of Rural Electrification Loans  
(000 omitted)

	<u>Amount Authorized</u>	<u>Letter of Credit</u>	<u>Disbur se- ments</u>	<u>Pipeline</u>
VRESCO	2,116	2,116	2,116	0
MORESCO	1,302	1,302	1,302	0
Rural Elec. Svcs.	600	600	600	0
RE I	19,400	19,400	19,400	0
RE II	18,000	18,000	17,300	700
RE III	20,000	20,000	11,100	8,900
RE IV	<u>20,000</u>	<u>6,800</u>	<u>0</u>	<u>20,000</u>
Totals	81,418	68,218	51,818	29,600

These financial inputs from AID together with the inputs of several other donors and the majority contribution of the GOP have resulted in a rapidly increasing and expanding rural electrification program. As of the end of CY 1976 there were 79 registered cooperatives, 59 of them totally or partially energized, providing electricity to 414 communities and about 3,900 villages. A total of almost 470,000 households were being served reliable, reasonably priced electricity, to the benefit of the approximately 2.8 million men, women, and children residents of those households.

The benefits of the rural electrification program cannot merely be measured by the number of people receiving electricity in their homes, however. The rural electrification program in the Philippines is implemented through the medium of cooperatives, and these cooperatives have important "participation" overtones -- overtones which are important in the socio-politico-economic daily lives of the participants. Member-owned electric cooperatives is for many Filipino rural poor their first opportunity to positively influence their own lives. Accustomed to exploitation by centuries of absentee landowners who controlled an indifferent government, but keenly aware of the disadvantages of non-ownership of the land or the other factors of production, these people are now in a position to enjoy and participate in the shared ownership and control of the electric cooperative -- together with the responsibilities that entails.

The cooperatives thus offer electricity to their constituents, and through electricity more conveniences, more production, more employment opportunities and more services, but they also offer participation and responsibility and even ownership and control. By becoming a member of the cooperative, by speaking up and voting at local cooperative meetings, by serving on committees, by assuming the responsibility and the ownership and the control, these rural people learn to influence and even better control the events of their daily lives, their socio-politico-economic environment, their futures and the futures of their children.

AID participation in this program through this project thus provides Juan dela Cruz (the Filipino common man) a bigger role in shaping his destiny. The rural electrification program thus supports an increase in agricultural and industrial production, a regional dispersion of investment and employment opportunities, an improved standard of living, and an opportunity for the rural poor of the Philippines to better participate in the processes that influence their lives.

Likewise, the implementation of the rural electrification program has resulted in a strengthened NEA. Its ability to administer a national program, to assist the cooperatives to develop and improve their management and financial systems and procedures, and to monitor and improve the work of construction contractors and A&E firms can no longer be doubted.

The construction contractors as well as the A&E firms themselves have developed and matured to a point where the need for consultancy from the National Rural Electric Cooperative Association (NRECA) and Stanley Consultants, Incorporated (SCI) has diminished considerably and may soon be phased out.

The private sector likewise has benefited from the program. For instance, during the early stages of the program pole requirements were only 1,000 a month and only few firms provided poles. Now, pole requirements are roughly 10,000 a month and 12 private sector pole treatment plants have arisen all over the country to supply these requirements on an economical basis. Also, RE IV permitted local manufacturers to participate in international bidding. This is expected to stimulate private enterprise expansion of its existing facilities and encourage them to transform and install new plants to provide the various commodity requirements of the program.

The entire program has developed into a model for other third world countries to emulate. Already NEA and USAID have conducted several rural electrification training programs in the Philippines for officials of other countries in the region, i. e., Indonesia, Pakistan, Bangladesh, India and Papua New Guinea (see Annex C, International Training Program).

These many successes, enumerated in the preceding paragraphs, have been achieved with AID's assistance as a crucial input. The GOP recognizes that its overall rural electrification program requirements are too vast for AID to be the sole source of external financing; other lenders and/or donors will have to be involved. In this connection the GOP has sought IBRD assistance as early as 1975. However, assistance from the IBRD will not be available until mid to late 1978, and materials financed from an IBRD loan cannot be expected to arrive until CY 1979. There exists a gap in funding which will severely disrupt NEA's commodity pipeline. The disruption of the pipeline would have a detrimental effect throughout the program. Trained staff of the A&E and construction firms will migrate to different projects or leave

the country for work in Iran or Saudi Arabia, experienced NEA staff may have to be released, cooperatives will be unable to serve new members, and the credibility of the program will be compromised. This is a situation that those who have been involved in building the program to its present level are very hopeful will not happen. An interim bridge loan from AID would insure adequate funding of NEA's program until the IBRD financing becomes available.

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project:  
From FY 1978 to FY 1980  
Total U.S. Funding \$ 8,400,000  
Date Prepared: June 1, 1977

Project Title & Number: RURAL ELECTRIFICATION

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS									
<p><b>Program or Sector Goal: The broader objective to which this project contributes: (A-1)</b></p> <p>AN IMPROVED STANDARD OF LIVING FOR RURAL PEOPLE.</p>	<p><b>Measures of Goal Achievement: (A-2)</b></p> <ol style="list-style-type: none"> <li>1. AVERAGE RURAL FAMILY REAL INCOMES IN COOP AREAS INCREASED BY 20 PERCENT BETWEEN 1974 AND 1980.</li> <li>2. BY 1980, AT LEAST 20 PERCENT OF RESIDENTS OF COOP AREAS REALIZING INCOMES FROM JOBS THAT DID NOT EXIST BEFORE ELECTRICITY BECAME AVAILABLE.</li> <li>3. BY 1980, AT LEAST 40 PERCENT OF COOP AREA RESIDENTS HAVING READY ACCESS TO SOCIAL SERVICES (E.G., MEDICAL ADVICE, EDUCATIONAL PROGRAMS, RADIO, TELEVISION, CULTURAL EVENTS, ETC.) THAT WERE NOT AVAILABLE PRIOR TO THE ARRIVAL OF ELECTRICITY.</li> </ol>	<p><b>(A-3)</b></p> <p>CENSUS STATISTICS, NSA STATISTICS, INDEPENDENT ANALYSES OR STUDIES.</p>	<p><b>Assumptions for achieving goal targets: (A-4)</b></p> <ol style="list-style-type: none"> <li>1. THAT AVAILABLE ELECTRIC POWER WILL ENCOURAGE SMALL SCALE OR ANCILLARY INDUSTRY TO LOCATE OR RELOCATE IN RURAL AREAS.</li> <li>2. THAT ELECTRIC COOPS WILL COOPERATE WITH OTHER ORGANIZATIONS (SUCH AS IRRIGATORS SERVICE ASSOCIATIONS, MARKETING OR PRODUCTION COOPS, ETC.) FOR MUTUAL BENEFIT.</li> <li>3. THAT AN ABSENCE OF RELIABLE ENERGY IS AN INHIBITING FACTOR IN THE ALLOCATION OF PUBLIC AS WELL AS PRIVATE RESOURCES.</li> </ol>									
<p><b>Project Purpose: (B-1)</b></p> <p>INCREASED PRODUCTION AND IMPROVED DAILY AMENITIES MADE POSSIBLE BY RELIABLE ELECTRIC POWER AVAILABLE AT REASONABLE RATES IN RURAL AREAS.</p>	<p><b>Conditions that will indicate purpose has been achieved: End-of-Project status: (B-2)</b></p> <ol style="list-style-type: none"> <li>1. ELECTRIC POWER AVAILABLE 24 HOURS A DAY TO ONE-THIRD OF THE RURAL POPULATION.</li> <li>2. AGRICULTURAL PRODUCTION (ESPECIALLY RICE) INCREASED BY 20 PERCENT IN COOP AREAS, AND ACTUALLY DOUBLED IN AREAS WHERE ELECTRIC PUMP IRRIGATION SYSTEMS HAVE BEEN INSTALLED.</li> <li>3. ALL CONNECTED HOUSEHOLLS HAVING AT LEAST ONE LABOR-SAVING OR CONVENIENCE ELECTRIC APPLIANCE, AND 30 PERCENT HAVING THREE OR MORE.</li> </ol>	<p><b>(B-3)</b></p> <p>NSA STATISTICS, FINEC STATISTICS, DEPARTMENT OF AGRICULTURE STATISTICS, INDEPENDENT STUDIES, PROJECT EVALUATION.</p>	<p><b>Assumptions for achieving purpose: (B-4)</b></p> <ol style="list-style-type: none"> <li>1. THAT COOPS WILL BE CAPABLY SELF-MANAGED, SELF-MAINTAINED, AND SELF-POLICED; AND THAT THEY WILL BE AT LEAST AS EFFICIENT AS PRIVATE UTILITIES.</li> </ol>									
<p><b>Project Outputs: (C-1)</b></p> <ol style="list-style-type: none"> <li>1. VIABLE ELECTRIC COOPERATIVES.</li> <li>2. BACKBONE SYSTEMS.</li> <li>3. A CAPABLE NATIONAL ELECTRIFICATION ADMINISTRATION.</li> <li>4. QUALIFIED A&amp;E FIRMS AND CONSTRUCTION CONTRACTORS.</li> </ol>	<p><b>Magnitude of Outputs: (C-2)</b></p> <ol style="list-style-type: none"> <li>1. AT LEAST ONE VIABLE RURAL ELECTRIC COOP ESTABLISHED IN EVERY PROVINCE BY 1977, EXCEPT FOR SEVERAL OF THE SMALL ISLAND PROVINCES.</li> <li>2. WITHIN EACH COOP AREA, A BACKBONE SYSTEM ELECTRICALLY LINKING ALL MUNICIPALITIES AND MAJOR POPULATIONS COMPLETED BY 1980.</li> <li>3. THE PERSONNEL OF NSA TRAINED AND EXPERIENCED, CAPABLE OF ADMINISTERING A NATIONAL PROGRAM WITHOUT REGULAR OUTSIDE TECHNICAL ASSISTANCE BY 1980.</li> <li>4. QUALIFIED A&amp;E FIRMS AND CONSTRUCTION CONTRACTORS CONSTRUCTING ERROR-FREE DISTRIBUTION SYSTEMS BY 1980.</li> </ol>	<p><b>(C-3)</b></p> <p>NSA RECORDS, INDEPENDENT EXPERT JUDGMENT, PROJECT EVALUATION.</p>	<p><b>Assumptions for achieving outputs: (C-4)</b></p> <ol style="list-style-type: none"> <li>1. THAT IT WILL PROVE TO BE FEASIBLE AND WARRANTED TO ESTABLISH AT LEAST ONE COOP IN EACH PROVINCE.</li> <li>2. THAT GOP AND AID PRIORITIES WILL RESULT IN CONTINUED SUPPORT OF THE PROJECT AND PROGRAM.</li> <li>3. THAT NSA WILL EFFICIENTLY AND EXPERTLY LEAD ASSISTANCE AND GUIDANCE TO THE COOPS.</li> </ol>									
<p><b>Project Inputs: (D-1)</b></p> <p>U.S. AID: FY 76 LOAN \$ 8.4 EXCESS PROVENTY (AS AVAILABLE)</p> <p>EUR</p> <table border="1"> <tr> <td>NSA</td> <td>FY 77</td> <td>\$ 33.3M</td> </tr> <tr> <td></td> <td>FY 78</td> <td>\$ 39.2M</td> </tr> <tr> <td></td> <td>FY 79</td> <td>\$ 57.4M</td> </tr> </table>	NSA	FY 77	\$ 33.3M		FY 78	\$ 39.2M		FY 79	\$ 57.4M	<p><b>Implementation Target (Type and Quantity) (D-2)</b></p> <p>1977-1979 TECHNICAL ASST. FROM NREDA AND SCL</p> <p>SIGNED LOAN AGREEMENT Dec. 78</p> <p>2 1st QUARTER 78 178 APPROX.</p>	<p><b>(D-3)</b></p> <p>NSA, NREDA, AND AID RECORDS AND DOCUMENTATION.</p>	<p><b>Assumptions for providing inputs: (D-4)</b></p> <ol style="list-style-type: none"> <li>1. THAT GOP AND AID PRIORITIES RESULT IN CONTINUED SUPPORT OF THE PROJECT AND THE PROGRAM.</li> </ol>
NSA	FY 77	\$ 33.3M										
	FY 78	\$ 39.2M										
	FY 79	\$ 57.4M										

PART III  
PROJECT ANALYSIS

A. TECHNICAL ANALYSIS

1. General Overview

The Philippine RE Program is patterned after the U.S. rural electrification program as implemented by the U.S. Rural Electrification Administration (REA). The GOP's program has benefited from the experience gained in the U.S. since the 1930's. Just as with the REA, in the Philippine Program financial and technical assistance is provided by a central agency with individual cooperatives operating autonomously, (owning, operating, managing and maintaining their own systems and responsible for repayment of loans and other financial assistance provided by NEA).

Technical assistance financed by AID is provided to NEA by two consulting firms. The U.S. National Rural Electric Cooperative Association (NRECA) provides assistance in operation and administration of individual cooperatives and makes recommendation to NEA on the overall RE policies to individual cooperatives. The NRECA team is made up primarily of former REA Managers.

In addition to NRECA, technical assistance for design, construction, maintenance, operation and training of personnel for cooperative electric systems is provided by Stanley Consultants Incorporated (SCI). SCI has years of consultants and engineering experience in the U.S. REA Program. SCI also provides assistance to NEA in the preparation of materials requirement, estimates, specifications, and the procurement of materials through international bidding.

The actual engineering work on the RE Program is done by four Philippine Engineering firms. They are: Trans-Asia, Adrian Wilson, Inc., DCCD Engineering Corporation, Engineering and Development Corporation of the Philippines.

SCI works very closely with these firms and assists NEA review their engineering design, specification and bid documents. The Philippine engineering firms have made enormous progress in their professional capabilities and have now reached a point where only occasional assistance from SCI is necessary and where they are becoming recognized as a possible source of engineering experience to other countries within the region.

The Philippine RE Program is a multi-phased development program that is growing at an accelerated rate. If present plans are carried out as anticipated, the program will grow at an increasing rate until 1984 when it is anticipated that 90% of the population areas will be electrified. RE Program goals are presented below:

Table 2  
Incremental and Cumulative Program Goals

Year	Household Connections		Village Energized	
	Annual	Cumulative	Annual	Cumulative
73 - 76		470,500		4,068
77	278,900	749,400	2,524	6,592
78	386,900	1,136,300	3,554	10,146
79	395,100	1,531,400	4,009	14,155
80	493,300	2,024,700	4,534	18,689
81	566,200	2,590,900	4,521	23,210
82	571,200	3,162,100	4,488	27,698
83	572,100	3,734,200	4,173	31,871
84	572,100	4,306,300	2,414	34,285

## 2. Power Generation

There are only two sources of power available to Rural Electric Cooperatives, internally generated power from generators and power purchased by cooperatives from National Power Corporation (NPC). Generally, NPC supplies most of the needs of cooperative consumers in Luzon and Mindanao, however, in the Visayas Region the cooperatives generate their own power.

At the present time NPC and Manila Electric Company (MERALCO) generate 2,165 megawatts (MW) of power in the Luzon Region from hydroelectric, diesel, and thermal plants. By 1987 the generating capacity for Luzon will be 5,370 MW from geothermal, nuclear, hydroelectric, pumped storage systems and the residual fossils fuel thermal units. No new oil burning thermal plants are planned for this region. In the other two regions of the country, the Visayas and Mindanao, NPC presently generates 2 MW and 205 MW, respectively.

By 1988, NPC plans to develop 1,000 MW of power in the Visayas Region, and 2,150 MW in Mindanao. Power in these two regions will be supplied by hydro and geothermal units exclusive. During the next decade, country-wide NPC power generation capacity will increase by 6,150 MW for a total availability of 8,520 MW. (See Annex D for more details on Power Generation Plans.)

RE cooperatives are currently producing 40 MW of power, mostly from excess property diesel plants. The cooperatives also have approximately 130 MW of generation capacity that is awaiting installation and connection to the backbone system. NEA currently plans on installing an additional 70 MW power generating capacity to meet cooperative needs in areas not serviced by NPC. These generating sets were purchased in 1975 from an \$18.0 million French Loan. When the backbone transmission system connects cooperatives areas to the NPC power grid, the smaller, and less economical generating units will be removed and installed in other

areas where the service is being extended, i.e., the many small islands. NEA foresees a continued need to have power generating capacity for rural and remote areas where the NPC grids cannot be extended.

### 3. Transmission and Backbone Lines

It has been NEA Policy not to duplicate services offered by National Power Corporation (NPC). However, in areas where NPC is for economic or other reasons, unwilling or unable to construct transmission lines to serve RE Cooperatives systems, NEA will provide these services with NPC's understanding that they will eventually purchase the lines and substations from NEA. Generally, cooperatives purchase power from NPC in Luzon and Mindanao where power is available from the NPC grid system at 69 Kilo Volts (KV).

On the larger islands in Visayas, 69 KV transmission lines also are being constructed by NEA to interconnect the cooperatives and the larger centrally located internal combustion generating plants that also are being installed either by NPC or NEA. In addition to the 69 KV transmission lines, NEA is constructing 13.8 and 7.6 KW "backbone" systems that connect major population areas. The backbone system allows greater economies of scale by interconnecting generating facilities. For instance on these larger islands the 69 KV lines and the backbone system will allow several individual cooperatives to receive power from a central plant that uses the cheaper bunker "C" oil resulting on a substantial saving to the cooperative, and in turn reduced electric rates. A good example is on Panay Island where two provinces are interconnected to a central power plant operated by a single cooperative. Another example is the Leyte cooperative construction of a 69 KW line that will span the length of the island to make more efficient use of larger generating facilities to take advantage of a large power plant thereby providing the means to extend power lines to remote areas. Also, at the present time NEA is constructing 69 KV lines in Mindanao to serve remote areas not in the NPC schedule.

Approximately 6,200 kilometers of 69 KV transmission lines are planned by NEA for construction through 1981. Approximately 23,000 kms of backbone system are planned for construction through 1981. See Annex D for a summary of the NPC Power Expansion Program.

### 4. Project Cost

In the past AID's project assistance has provided both grant and loan funds to the Philippine RE Program. During the first years of the program grant assistance was used to finance consultants - NRECA and SCI who have provided technical inputs to the program. In recent years consultant services have been loan financed just as all materials and equipment have been throughout the life of the program. Exclusive of the technical services and the cost of the

Pilot Projects, approximately \$73.0 M of FX material assistance has been provided to NEA from the \$81 M AID Loans for relending to individual cooperatives. A complete breakdown by general material schedules is shown in Table 3.

The estimate of materials needed to meet program targets are a subject of detailed planning. The calculation of material requirements and costs are tabulated based upon these planned house connections, village distribution systems, transmission lines and cooperatives energization projections. Using a computer programmed itemized materials requirements for an average installation, the total program cost requirements are calculated. Table 5, Page \_\_\_\_\_, provides the cumulative materials requirements for the program from 1973 through 1981. The list below provides a general schedule of materials and cost for this proposed \$200 M loan. No consultant services are proposed for financing under this loan, procurement will be limited to material as shown below:

Conductor	\$ 8,400,000
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\$ 8,400,000

The GOP has given the RE Program a high funding priority in the past and has shown every indication that NEA will continue to receive a high level of peso contributions for project implementation. The GOP provides all peso requirements for the project including contractor and A&E fees, labor, and locally procured items such as poles, crossarms, and locally purchased installation materials. GOP contributions are estimated at the equivalent of \$25-30 M a year through 1984. See Table 4 for NEA financial inputs.

Under Presidential Decree No. 269, NEA is capitalized at one billion pesos (approximately US \$135 Million equivalent). Subscriptions of capital stock are paid to NEA by the GOP as project implementation progresses. These payments form the bulk of Peso counterpart funds for the program. As of April 30, 1977, ₱566 million (equivalent US \$75 Million) have been invested in NEA by the GOP. Subscribed but unpaid capital stocks, as of said date, total ₱444 M (equivalent US \$60 Million) and should be sufficient to meet the requirements of on-going projects and activities to be covered by the proposed loan. As of April 30, 1977, releases to all cooperatives total in excess of \$100 Million equivalent.

##### 5. The "Funding Gap"

Two analyses are presented, first, to demonstrate the existence of a funding gap in the RE program and, second, to explain its magnitude. The first presentation will be from a macro-perspective of the

**TABLE 3**  
**STATUS OF MATERIAL ARRIVAL**  
**As of December 31, 1976**

MATERIAL	BID	AMOUNT (\$1,000)		%	DELIVERY DATES	
		CY 1976	TOTAL TO DATE		ARRIVED	
					50%	100%
<b>IFB-1-4 *</b>						
B-Hardware	7624	142	7674**	100	MAY 74	MAY 76
C-Insulator	1324	263	1311	99	JUN 74	JUL 76
D-Conductor	10983	421	10982	97	JUL 74	FEB 76
E-Conductor Access.	737	197	728	99	JUL 74	JUN 76
F-Dist. Equipment	457	45	455	99	FEB 74	MAY 76
G-Dist. Transform.	5803**	67	5823**	100	SEP 74	MAR 77
H-Oil Circuit Reel	1357	136	1223	90	FEB 74	JUL 76
I-Connectors Tools	777	174	741	96	FEB 74	MAY 76
J-Meters & Dist Transformers	1347	982	1238**	92	MAR 74	AUG 76
K-Installation Met	300	122	292	97	MAY 75	MAY 76
L-St Lighting Eqpt.	1255	50	1239	99	JAN 75	JUN 76
M-Miscellaneous	1286	—	1277	99	MAY 74	MAY 76
N-Hand Tools	862	208	862	96	NOV 74	JUL 76
R-Subs. Equipment	534	126	534	100	JUL 75	SEP 76
S-Swithing Equip.	420	191	191	45	JUL 76	OCT 76
T-Subs. Transform	607	—	—	—	—	—
Others (Purchased)	38	21	38	100	—	—
<b>Sub-Total</b>	<b>35719</b>	<b>3516</b>	<b>34331</b>	<b>96</b>		
<b>IFB-5-0</b>						
B-Hardware	2725	—	1283	47	SEP 76	NOV 76
C-Insulator	766	—	22	3	SEP 76	MAY 77
D-Conductor	7545	—	1483	20	FEB 77	SEP 77
E-Conductor Access.	177	—	176	99	SEP 76	DEC 76
F-Dist. Equipment	183	—	95	52	SEP 76	DEC 76
G-Dist. Transform.	1818	—	1817	99	DEC 76	DEC 77
H-Oil Circuit Reel	1231	—	239	19	OCT 76	MAY 77
I-Connectors Tools	441	—	207	47	SEP 76	NOV 77
J-Meters & Dist Transformers	5153	—	2211	43	OCT 76	APR 77
K-Meters, Test Eqpt.	231	—	—	—	SEP 76	NOV 76
L-St. Lighting Eqpt.	799	—	425	53	SEP 76	DEC 76
M-Miscellaneous	613	—	101	16	SEP 76	NOV 76
N-Hand Tools	820	—	317	39	NOV 76	JAN 77
R-Subs. Equipment	976	—	298	31	DEC 76	MAR 77
S-Swithing Eqpt	520	—	—	—	—	—
T-Subs. Transform	1201	—	—	—	APR 77	SEP 77
U-Subs. Structures	430	—	—	—	—	—
<b>Sub-Total</b>	<b>25647</b>	<b>3516</b>	<b>8674</b>	<b>34</b>		
<b>TOTAL</b>	<b>61,366</b>	<b>3,516</b>	<b>43,005</b>	<b>70</b>		

\*\* Re-evaluated

\* Invitation for bid utilizing USAID loans I-IV

Project Funding Exclusive of AID Loans  
(in thousands of US \$)

Item	1973-1976	1977	1978	1979	1980	1981	1982	1983	1984	Total
Distribution Projects	6,350	5,751	7,394	7,558	7,558	7,558	7,723	7,723	7,723	65,338
Timber Products	5,143	4,120	5,363	5,482	5,580	5,653	5,768	5,769	5,724	48,602
Labor and Other										
Transmission Projects	167	512	1,245	1,295	1,800	1,500	700	700	700	8,619
Timber Products										
Labor and Other	714	393	2,028	2,159	3,000	2,500	1,200	1,200	1,200	14,594
Generating Projects	17,300									17,300
French Loan										
US Excess Property	4,700	1,875	1,500	50	50	50	50	50	50	8,375
Labor and Other	3,429	2,000	1,500	750	500	225	225	225	225	9,079
Headquarters Projects	11,429	4,725	4,725	4,725	4,725	4,725	4,725	4,725	4,725	49,229
Turn Key										
Engineering Fees	6,143	2,849	3,767	3,668	3,673	3,695	3,742	3,737	3,728	34,999
NEA Administration	6,589	3,454	3,700	3,720	3,767	3,593	3,952	4,348	4,782	37,905
TOTAL	61,964	25,679	31,222	29,407	30,653	29,499	28,085	28,477	28,854	293,840

NOTES: 1) 1973-1976 expenditures include a US \$17.3 million loan from France for diesel-electric generator sets.

2) NEA also finances house wiring installations through a revolving fund procedure. This will vary from an average level of US \$5.0 million in the 1977-1978 period to approximately US \$16.0 million in 1985 before tapering off to negligible assistance by 1990.

total Inflow/Outflow of foreign exchange funds and materials. In addition to providing a simple overview of the entire program, it also will serve as a verification of the detailed presentation.

a. Macro Analysis of Gap

In this analysis, only the inflow and outflow of foreign exchange funds or imported commodities will be studied. As of December 31, 1976, NEA had received the following FX funds:

A.I.D. Loans	\$ 81 Million
French Commercial Loan	18
Japanese Reparations	6
NEA Peso Conversion	8
Total Available FX	<u>\$ 113 (Inflow)</u>

Now a look at the Outflow: As of December 31, 1976, the following were utilizations of imported materials and equipment:

Installed Distribution	\$ 46 Million
Installed 69 KV Transmission	8
Delivered French Generators	18
Consulting Services & bank charges	3
Tools (one time purchase)	2
Subtotal through 1976	<u>\$ 77</u>
1977 Program - 250,000 connections at \$100 ea.*	25
Total through 1977	<u>\$ 102 (Outflow)</u>

Consequently, availability at the start of 1978 would be \$11 Million (the difference between \$113 M and the \$102 M). A safe pipeline has been estimated to be not less than \$10 M, therefore, with IBRD's funding not expected to be available for disbursement until late 1978, existing FX availabilities will not carry the program safely beyond 1977.

b. Detailed Analysis of Gap

NEA, assisted by Stanley Consultants, Inc., has completed a province by province, village by village, plan of development to meet the 1984 mid-range goals. Annex B-3 provides the schedule of construction of distribution lines by year and by cooperative. It also gives the number of connections to be made each year. Annex B-4 breaks these figures down even further into schedules of connections by villages (barrios) and towns. Using the detailed planning

\*By December 31, 1976, the cooperatives had installed 470,500 connections. The cost for the distribution system to service those connections was \$46 million of imported material, which is an average of approximately \$100/connection .

represented by Annexes B-3 and B-4, schedules of material requirements were developed for each year up through 1984, and a cost summary for these imported materials is presented on the following page in Table 5.

Table 6 utilize the cumulative total program requirements presented in Table 5 as the "Outputs" for the gap analysis. The "Inputs" shown in Table 6 are the cumulative value of imported material and are listed by the year they are expected to arrive in-country. The "Inputs" are forecasted for existing FX Loans and firm IBRD, OECF and the ADB commitments. The difference between Inputs and Outputs in Table 6 gives the cumulative End of Year surplus or deficit for the program. Ideally the surplus should not drop below \$10 Million to maintain a safe pipeline margin. From this presentation it can be seen that the 1978 deficit will be \$12 Million and will increase to a \$26 Million deficit by 1981 if additional foreign exchange is not found. Adding in a minimum \$10 Million pipeline which should be maintained, the 1978 deficit will be \$22 Million.

c. Another Perspective of the Gap

Further evidence that the program will exhaust all major commodity stocks in 1978 is demonstrated by taking several of the major material items and analyzing them on an item by item basis. For instance, meters: Including meters to be purchased in July 1977 (IFB No. 10) using the balance of RE IV loan funds, NEA will have purchased a total of approximately 925,000 meters (including purchases through Peso conversion to foreign exchange). At the end of 1976, over 470,000 meters had been installed; during 1977 another 250,000 are to be installed, leaving slightly more than 200,000 to start 1978. With 387,000 connections scheduled for 1978, the supply would be totally exhausted by June-July 1978. The same analytical approach to all major items shows that all material stocks will be exhausted almost simultaneously. Therefore, given a lead time of six to eight months, the latest order date to assure continued supply of meters would be November 1977.

d. Impact on the RE Program

Granted the fact that a funding gap does exist, the next task is to assess the impact on the program if funds are not made available in a timely manner. Such an assessment is difficult to quantify since much of the adverse impact can be defined only in subjective terms. It is not sufficient to suggest that the program be slowed down for a year until other funding becomes available. There are on-going contracts for both design and construction, many of which would have to be abrogated completely to have any effect on imported materials drawn down. As of June 1977, NEA had on-going 23 A&E design and supervision of construction contracts, 13 construction of headquarter facilities contracts, 5 for construction of transmission systems, 31 for construction of distribution systems (not including 18 other systems being constructed by force account), and 21 for construction of power plant facilities.

**Table 5**  
**RE Program Requirements of Imported Commodities**  
(in thousands of US \$)

	73-76	77	78	79	80	81	82	83	84
Hardwares	8,150	5,900	8,580	7,990	9,220	9,520	9,530	9,530	9,530
Insulators	850	890	1,150	900	940	980	990	990	990
Conductors and Accessories	8,670	8,940	14,470	13,560	15,610	16,900	17,370	17,170	17,170
Dist. Transformers	5,290	3,810	5,180	5,400	6,190	6,950	7,220	7,220	7,220
Meters	4,630	2,200	3,060	3,090	3,340	3,540	3,610	3,610	3,610
Luminaires	1,710	530	790	790	930	980	1,000	1,000	1,000
Guy Wire	1,120	1,480	2,070	2,280	2,610	2,760	2,800	2,800	2,800
Substation and Sectionalizers	3,490	3,720	4,570	2,450	2,460	2,460	2,460	2,460	2,460
<b>TOTAL</b>	<b>33,910</b>	<b>27,470</b>	<b>39,870</b>	<b>36,460</b>	<b>41,300</b>	<b>43,550</b>	<b>44,780</b>	<b>44,780</b>	<b>44,780</b>
<b>Cumulative Total (carry to Table 6)</b>	<b>33.9</b>	<b>61.4</b>	<b>101.3</b>	<b>137.7</b>	<b>179.0</b>	<b>222.6</b>	<b>267.3</b>	<b>312.1</b>	<b>356.9</b>

**Table 6**  
**GAP Analysis**  
**Cumulative FX Materials Requirements and Arrivals**  
**(less tools)**

	<u>1973-76</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
1. <b>INPUTS (Material Arrivals):</b>						
a. Japanese Reparations	6.0	6.0	6.0	6.0	6.0	6.0
b. NEA FX	8.0	9.0	10.0	11.0	12.0	13.0
c. USAID Loan I-IV	40.9	57.8*	72.9**	72.9	72.9	72.9
d. IBRD Loan 1				12.5	25.0	25.0
IBRD Loan 2						25.0
e. OECF				20.0	20.0	30.0
f. ADB					25.0	25.0
Sub-total INPUTS	54.9	72.8	88.9	122.4	160.9	196.9
2. <b>OUTPUTS (Materials Required):</b> (cumulative totals - Table 5)	33.9	61.4	101.3	137.7	179.0	222.6
3. <u>GAP - End of Year Difference</u>	21.0	11.4	(12.4)	(15.3)	(18.1)	(26.7)
4. Recommended Pipeline (Reserve)	(10.0)	(10.0)	(10.0)	(10.0)	(10.0)	(10.0)
5. <u>GAP - with Reserve</u>	11.0	1.4	(22.4)	(25.3)	(28.1)	(36.2)

**\*CY 1977 Arrivals from AID Loans I-IV**

1. IFB #4	US \$	630,000
2. IFB #5		2,280,000
3. IFB #7		306,000
4. IFB #8		13,380,000
5. IFB #9		300,000
6. IFB #10		-
		<u>16,896,000</u>
7. Prior 1977		<u>40.9</u>

**Total US \$ 57.8 (by December 1977)**

**\*\*AID Loan USES (I - IV)**

Materials	US \$72.9
Tools	2.1
Consulting	
NRECA	1.0
SCI Eng.	1.5
Bank Charges	.5
Total	<u>\$ 78.0</u>

Figure A, from RE IV Project Paper, updated to June 1977 shows that disbursements are on schedule and commitments are six months ahead of schedule. From this progress chart it can be seen that program utilization is fairly constant at approximately \$2 million per month; therefore, to make any substantial effect upon the flow of import utilization, a least half of the work would have to be stopped. The extent of the adverse ripple effect throughout the NEA program is anyone's guess, but there is no doubt about the fact that it would be large. Neglecting the costs involved for contract abrogations, the enormous destructive potential of NEA's credibility cannot be overemphasized. The issue of program credibility has been discussed in both RE III and RE IV loan papers, because it is considered to be the single most critically important reason for the success of the Philippine Rural Electrification Program. One of the most difficult problems facing project implementors in Third World countries is how to overcome the long history of government-spawned project failures which naturally result in the endemic poor credibility of most government agencies. For NEA, this once pervasive problem has been overcome through hard work and the ability to live up to their promises. A system had to be evolved which permitted the establishment of viable public service organizations that was respected and believed in by the people. Firmly established credibility; therefore, is the key element in the development of this program. To carry out such a task, NEA, in the course of implementing the program, has developed a system which, while based on the U.S. experience, is thoroughly adapted to local needs and is responsive to the Philippine socio-cultural milieu. The system:

- i. assure that cooperative leaders will be those with interest in the cooperative's growth and viability;
- ii. assure that members have substantial awareness of their responsibility, not the least of which is prompt payment of their bill;
- iii. and perhaps most importantly, assures that work proceeds at a pace sufficiently rapid, and in accordance with plans, so that people will begin to believe that what is said will be done (credibility).

It is the last crucial point, "to have people believe that what is said will be done, "that NEA does not wish to lose, and surely they will lose it with any substantial slow down of the program. The adverse impact upon NEA's credibility with the people will be strong and visible because NEA will be forced to make tough, pragmatic financial recommendations to the rural electric cooperatives to assure existing cooperatives maintain their financial viability. The development of the remote, less developed (representing the poorest provincial areas) undoubtedly will be the first areas to come under very close scrutiny. It is these

# RURAL ELECTRIFICATION

## STATUS OF U.S. LOAN ACTIVITY

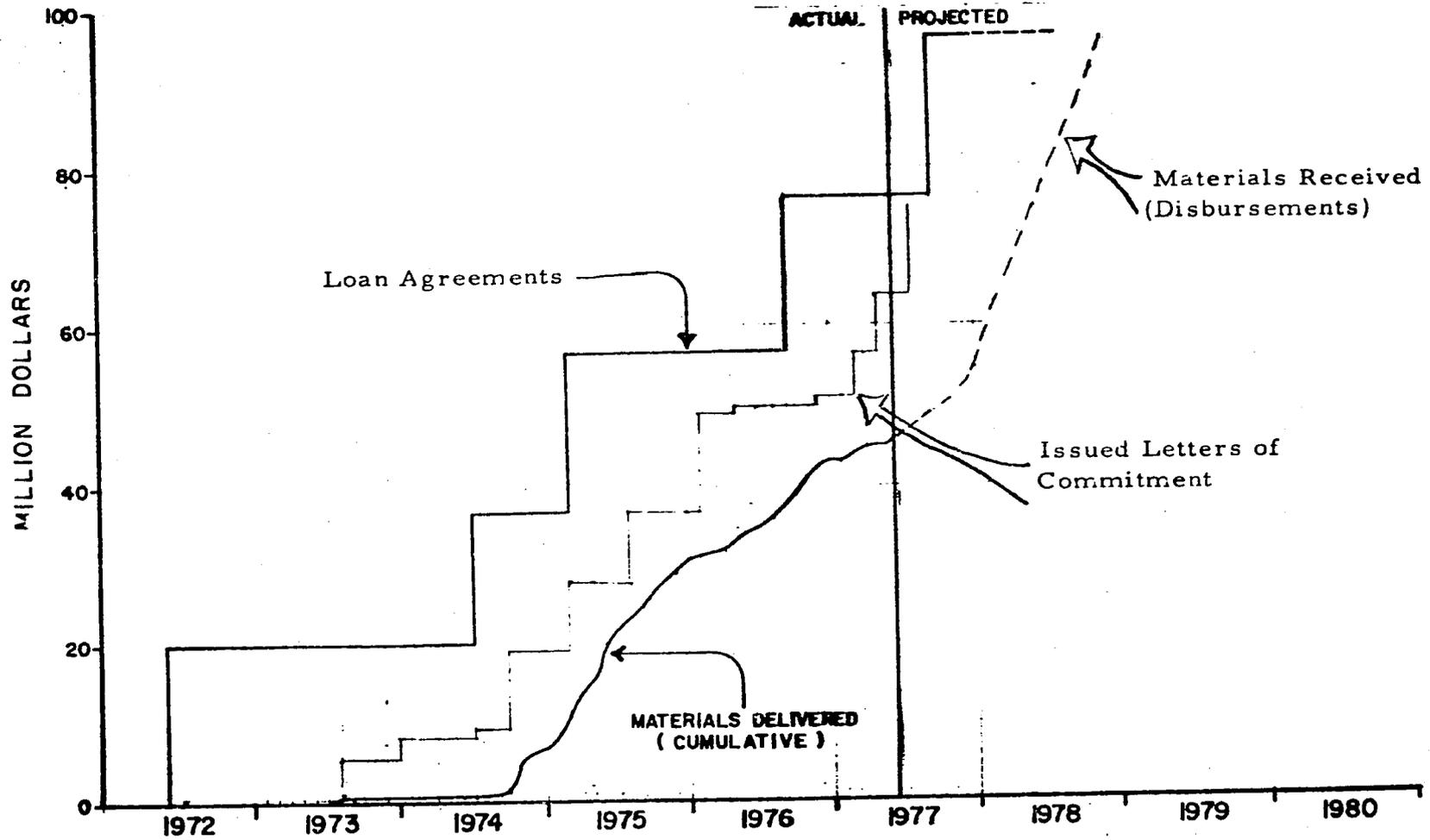


FIGURE A

remote areas that have the lowest density of consumers per kilometer of system and, therefore, utilize the most material per person served.

Up until this time NEA has consistently followed a policy of maximizing electrical connections to the lowest economic strata consistent with sound financial viability of the cooperatives. The concerns discussed above will seriously affect household connections in general but specifically household connections in remote, distant areas where per capita power consumption is low. In other words the poorest of the poor will be hit the hardest.

e. Impact Outside the RE Program

Immediate repercussions outside the program can be expected if program targets are curtailed. Business activity in the rural areas also has been based on electrification schedules. Start up of small scale industry and other small commerce activities, those that provide jobs in the non-farm rural sector, will be affected. Also, farmers will be affected, i.e., installation of irrigation pumps in anticipation of NEA schedules, will stand to lose some of their investment, but more seriously, when the program should start again, there would be a reluctance for early involvement of industry, commerce and farmers. The most disadvantaged, consequently, continues to be the poorest rural families.

6. Environmental Assessment

The potential for some adverse environmental effects which could be associated with the rural electrification program is recognized. However, no substantial adverse effects have become apparent from visual monitoring during the first five years of project implementation. The detailed environmental assessment currently underway as described below, may identify some adverse (either major or minor) effects, such as changes brought about by creation of new small scale industry and any resulting shift in human settlement patterns stimulated by the project. In addition, there might be some limited adverse environmental effects associated with the installation or maintenance of the distribution and electrical power generation systems. We anticipate that the overall Environmental Assessment will demonstrate an overwhelmingly positive effect and, further, any identifiable changes for improvement on the natural environmental can and will be incorporated into project implementation. The mission plans to complete its Environmental Assessment of the Rural Electrification Program within this calendar year (December 1977).

With the recent assignment of an environmental specialist to the Mission to work with a team of Filipino Specialists, provided by the Government of the Philippines Inter-Agency Committee on Ecological Studies (ICES) an environmental assessment has been initiated. The team of specialists has been identified and they have prepared a work plan.

The primary effort of the team will be directed to identify the actual extent of development (new industries attracted) and population concentration, if any, associated with past rural electrification projects. Several socio-economic assessments of projects funded under previous loans have either been completed and some data have been collected on several communities before and after the provision of electricity.<sup>1</sup> The team will examine approximately five communities in different areas of the Philippines, in order to determine whether there has been any actual adverse impacts on the environment which resulted from the increased human activity.

The secondary effort of the team will be directed to projecting the extent of any adverse effects on the natural environment resulting from generation of electricity and the installation and maintenance of transmission lines. The team will review the actual engineering plans for installation in different natural settings and the maintenance operations, including the consequence of using herbicides as opposed to their present practice of using hard labor to trim vegetation. The team does not anticipate finding any significant adverse environmental effects associated with these activities.

The completed environmental assessment will serve two purposes. First, if there are significant adverse impacts, it will identify for example, mitigating measures which could be incorporated in the on-going project. Second, it will provide some documentation for either supporting or rejecting a conclusion that rural electrification has insignificant adverse environmental effects. Data of this nature will be useful to other Missions in preparing Initial Environmental Examinations and Environmental Assessments.

## B. FINANCIAL ANALYSIS

### 1. Rural Electric Cooperatives - General

The sub-borrowers of NEA and individual implementing agencies will be the rural electric cooperatives themselves. Each of these cooperatives are non-stock, non-profit membership cooperatives organized for the sole and specific purpose of supplying electric service on an area coverage basis. Most of these electric cooperatives are registered under the provisions of Chapter III of Presidential Decree No. 269, although some are conversions of systems established under earlier acts.

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<sup>1</sup> The assessments referred to are Small University Studies, Recoop I and II and the National Survey. The U.S. Bureau of Census is also assisting the National Electrification Administration in collection and analysis of data.

Each cooperative has full corporate powers to operate as an electric utility and may generate, transmit and distribute electric power to its members and non-members up to ten percent of its membership. On the average, a cooperative serves a population area of some 30,000 households and an initial consumer load of around 5,000 customers. In general, the cooperatives are able to add some 3,000 additional connections each year until the cooperative area shall have been fully covered.

The electric cooperatives also have the authority to assist and promote power use through relending of NEA peso proceeds. Uses to date have been concentrated on house-wiring loans for low-income families and line extensions and related costs for electric irrigation pump projects.

The electric cooperatives are required to pay standard wholesale rates for power acquired from the National Power Corporation grid system. However, the cooperatives are exempt from taxes, duties, and fees levied by the GOP or its instrumentalities, including income tax, franchise taxes, import duties, etc.

The capabilities of management of the electric cooperatives have improved tremendously. While NEA continues to provide assistance in various aspects of system operations. This assistance is expected to diminish. Technical assistance by U.S. specialists has also diminished and can gradually be phased out without risk to the program.

An indication of cooperative management competence can be seen in the dramatic improvement of the coops' status of accounts with the National Power Corporation. Whereas in previous years, electric cooperatives had accumulated arrears as a result of payment deficits, total payments made to NPC for 1976 exceeded the total amount billed to cooperatives. Below is the summary of NPC power bill accounts from 1973 to 1976 indicating a favorable trend towards a continual decrease of cooperative indebtedness to NPC:

Table 7

SUMMARY OF NPC ACCOUNT OF ELECTRIC COOPS

<u>YEAR</u>	<u>KWH</u>	<u>TOTAL</u>	<u>TOTAL</u>	<u>ARREARS</u>	
	<u>CONSUMPTION</u> (1,000,000)	<u>BILLING</u> (P1,000)	<u>PAYMENT</u> (P1,000)	<u>ACCOUNT</u> (P1,000)	<u>%</u>
1973	15,354	1,320	487	833	64
1974	148,025	16,906	11,820	5,086	30
1975	199,752	30,434	26,252	4,182	14
1976	343,183	52,030	52,057	( 27)	
<b>TOTAL</b>	<b>706,315</b>	<b>100,690</b>	<b>90,616</b>	<b>10,074</b>	<b>10</b>

Electric cooperatives continue to shoulder an increasing share in building up their facilities. Two coops - Capiz and Aklan - have even ventured, with the assistance of NEA, into the construction of a 69 KV transmission line. The 70-kilometer line jointly being built by the Aklan and Capiz electric coops will link the two with power coming from 2 new 5,500-kilowatt French Pielstick generators installed at the Capiz coop. The total allocation of Pielstick Generators is shown in Table 8 below:

Table 8  
Allocation of Pielstick Generators

<u>Cooperative</u>	<u>No. of Units</u>	<u>Capacity (KW)</u>
Zamboanga City	2	3385
Cagayan	2	2500
Isabela	2	2500
Leyte I	2	3385
Samar II	2	2500
Capiz	2	5535
VRESCO	1	5535
Central Negros	1	5535
	1	3630
Oriental Mindoro	1	5535
	1	3630
Palawan	1	5535
	1	3630

## 2. Rates and Costs

The largest single factor in tariffs charged by electric cooperatives is the cost of power. Excluding the three cooperatives presently receiving power from the Agus Grid (MORESCO, Lanao Sur and Lanao Norte), the cost of power is roughly 60% to 80% of total cost to be covered by tariffs. While the national government through NPC is working to provide sufficient and relatively inexpensive power, the cooperatives themselves are actively working to keep this cost down by improving efficiency in generation for self generating cooperatives, and by line rehabilitation and load balancing to reduce line loss, and improve load and power factors (which result in lower KWH consumed or in lower effective rates) for all cooperatives. The new large generating sets which can run on bunker fuel, will reduce the cost of power significantly for many self-generating cooperatives, and expansion of the NPC grid will have even greater effect on others.

Cooperatives are also working to reduce non-power operating costs; through use of faster more sophisticated billing machines, through better communication with members and collection arrangements with banks, which reduce the need for repeat collection visits, through a more integrated transport system utilizing public transport, collectors resident in the area, and cooperatives furnished bicycles or motorcycles.

Cooperative tariffs also have to provide for return of investment costs. A grid-connected cooperative, with an investment of ₱20 M would have to set aside approximately ₱100,000 (\$14,000) per month to cover amortization of principal and interest. During the grace period, cooperatives have to set aside increasing percentages of the forecast amortization requirement, and afterwards, they also have to set aside a certain amount as their share towards future investment.

Data presented elsewhere in this paper indicate that by and large cooperatives are not only covering cash costs but also are setting aside funds for their expected amortizations. This fact coupled with rapid load growth will ensure payment of amortizations and will also allow absorption of high-cost funding in the future, without radical jumps in tariffs.

#### Pattern of Tariffs

NEA tariffs are socialized, in line with national policies on socialized pricing, and also considering the promotional effect of low rates for new consumers. A single rate is charged per kilowatt-hour for each class of consumer. This is a compromise between traditional economic downward-sloping block rates and more radical upward-sloping rates which have been experimented within the United States, and are presently used by the Manila Electric Company. AID has in the past provided short-term consultancy services in setting up the NEA adopted rate design, particularly in allowing for a preferential rate for the minimum bill residential consumer. Tariffs schedules presently include various fuel or energy cost adjustment clauses to allow instant adjustment to a very volatile cost-of-power situation.

While the authority for rate regulation rests with NEA, the development of rates proposals at the cooperative level is an interesting exercise involving economics, politics and mass communication. The cooperative's Board of Directors considers proposals developed by management, and then discuss these proposals with their respective constituencies. After Cooperative Board has approved the rate schedules, they are admitted to NEA for approval. Within broad limits, NEA strives to allow maximum freedom and flexibility for the individual cooperatives. Tariffs are widely publicized, and cooperatives "out-of-line" on the high side are forced by the members to drop their rates and bring them in line with the majority.

Cooperatives with tariffs that do not generate enough revenues have to exert extraordinary efforts to increase cost-efficiency.

### 3. Financial Planning.

As the cooperatives move out of the initial stages of operation, they have an increased capability as well as increased time to plan for the future. NEA, having worked out procedures and a routine for day-to-day operations, also can pay increased attention to the medium and longer-term.

Rural electrification planning has in the past focused primarily on the current year. The main activities have been (1) annual construction-energization plans, (2) conferences of cooperative presidents and general managers, (3) the annual work plan conference, and (4) the systems of reporting and monitoring. These activities have contributed significantly in keeping the pace of program implementation on schedule.

At present, nevertheless, NEA sees the need to look further ahead. The funding requirements of the program are sizeable, and indications are that while funds may be available, interest rates will be higher and maturities shorter. The questions of variation in re-loan terms, between financial strong and weaker cooperatives has been raised.

NEA has launched three activities: (a) developed a five-year perspective plan, specifying on an annual basis the towns to be formed into or added to existing cooperatives; (b) formulation at cooperative level of five-year development and financial plans, covering aspects of demand forecasting, construction operations, and finance (See Annex B-2 for examples of three Comprehensive Five-Year Development Plans. Asia/PD has copies of each complete report); and, (c) development of investment indicators, or key ratios with which to gauge cooperative viability. These three activities were undertaken to better define the magnitude of funding requirements, and at the same time, explore the question of variation in relending terms, as well as related issues of electric tariffs and cooperative share in investment costs.

#### a. NEA's Five-Year Perspective Plan

This plan spells out how NEA's medium term objective, electrification of all municipalities by 1980, is to be accomplished. In essence, it is the "phase-one backbone line" construction schedule. Major factors considered were the timetable for establishment of generation and transmission facilities of the National Power Corporation, the balance between regions of program development, the relationship of unserved areas with service (in the sense of geographical accessibility, political and economic

integrability) and the presence of extraneous factors, such as a peace-and-order problem, dictating either faster or slower implementation.

b. Five-Year Cooperative Plans

Three cooperatives were authorized and assisted by NEA in producing five-year plans. The heart of these planning documents consists of a four-page output form - summarizing load forecasts, construction requirements both physical and financial, projected tariffs, and projected financial statements including income statements, funds-flow and balance sheets. (Included for three cooperatives as Annex B-2). The total plans also include maps, area descriptions, a brief historical background of the cooperative, and detailed forecasts of village energization. (Not part of this paper because of document length).

c. Ratio analysis provides a quick means of gauging the viability of projects, at a given point in time, and the possibility of their withstanding stiffer or lighter loan terms. Ratio analysis is complemented by the cooperative medium-term plan in which the impact of specific assumptions of loan terms and tariffs can be measured.

NEA has developed, on an experimental basis, a set of eight "key ratios" for evaluation of cooperative viability. These are:

- (1) plant-revenue ratio
- (2) debt-service coverage
- (3) consumer density (number of consumers per kilometer of line)
- (4) KWH sales per kilometer of line
- (5) investment per consumer
- (6) operating expense per KWH
- (7) system loss
- (8) collection efficiency

Concepts. The two standard and more comprehensive ratios are the plant-revenue ratio (PRR) and the debt-service coverage ratio (DSC). PRR compares the gross value of distribution plant against the revenue from the distribution effort (cost of power, which is simply passed on is netted out). The ratio indicates how efficiently the distribution plant is used to produce revenues. The DSC ratio, on the other hand, measures the extent to which cash margins cover loan amortization payments. Since the cooperatives are still in their grace periods, the sufficiency of cash margins is gauged against target margins set by NEA policy, which indicates that increasing percentages of the prospective amortization be covered each year during the grace period.

At this stage the cooperatives cannot be expected to be utilizing their distribution plants fully. Some cooperatives, nevertheless, have made a significant number of hook-ups, indicating a good base in which KWH use and revenues can grow. This is measured by the ratio of consumers per kilometer of primary line. Some cooperatives already have a fairly developed load, and this is measured by KWH sales per kilometer of line. And some cooperatives have developed their revenue based at relatively low cost, measured by the investment per consumer ratio.

In pursuit of viability and aside from building up their loads, the cooperatives strive to increase efficiency in operations. An over-all gauge of this is the expenditure for the distribution effort, measured in centavos per KWH. System loss (the percentage of KWH generated or purchased which is unaccounted for) is another key statistic, indicating proficiency in maintenance and rehabilitation, quality of construction, and control of pilferage and cooperative discipline. Cooperative spirit and discipline is most clearly brought out, and has the most bearing on financial viability in the area of collections; the ratio used is the percentage of billings collected in the month billed.

Expectations. Benchmark figures for the U.S. cooperatives have been obtained. A typical U.S. electric cooperative would have a plant revenue ratio of 8:1. Debt service coverage would perhaps be 200% to 300%. The cooperative would have only 2 to 3 consumers per kilometer of line but could sell 30-40,000 KWH to these consumers. Investment cost per consumer would be high at \$1,015. Cost of distribution would be low at \$0.005 (₱0.04), system loss would average 12% and collection efficiency would be 99% of billings.

At this early stage, Philippine cooperatives should expect relatively less favorable ratios than in the U.S. A typical Philippine cooperative could have a PRR of 12:1 and a DSC based on target margins of 100%. The cooperative would be relatively dense with 50 consumers per kilometer of line, and could therefore sell as much energy, perhaps 30-40,000 KWH per km of line as the U.S. cooperative. In day-to-day operations, the typical cooperation could drop its operation cost (exclusive of generation charges) below ₱0.10 (1.3 U.S. cents) and system loss below 20%; it could boost its regular collections to 90% of billings.

The relatively modest expectations for operating efficiency merit further explanation. With many thousands of consumers to serve, and very small consumption per consumer, service costs should be high, low labor costs notwithstanding. Cooperatives with 100% new construction should show and do show low system losses. The typical cooperative, however, has acquired and still utilizes some old distribution equipment, which are typically substandard and overloaded, and which bring up the system loss

average significantly. The 90% collections target is programmed to increase gradually, perhaps by 1% per annum until a satisfactory level of 98% to 99% is reached. As consumers are educated to the cooperatives requirements and disconnection policies, as habits of regular payment are formed and finally as rural incomes increase both target and performance on this indicator should increase.

Performance Relative to Expectations. Data compiled for some forty-one electric cooperatives collectively totalling 378,000 consumers (81% of all electrified households as of December 1976) indicated that the majority of cooperatives are doing as well or better than expected.

The stronger ratios, predictably, are those indicating initial success in loan building. Less strong although still satisfactory, is the over-all performance involving financial returns. High plant-revenue ratios, for instance, are generally not attributable to over-investment (see investment per consumer ratio) but rather to low KWH consumption and possibly low tariffs. (Lowness of tariffs is a relative concept: Relative to financial needs tariffs may be low.) Because of inflation and low rural incomes, tariffs are perceived as high and barely reasonable (see Social Analysis Section). This has some bearing on collection efficiency and even possibly on system loss due to pilferage.

A recent tabulation of actual performance for the 41 cooperatives studied is detailed in Annex B-8. The consolidated standings of performance for the 41 cooperatives relative to expectations are shown in Table 9 and the individual standings of the 11 strongest cooperatives are shown in Table 10.

Table 9  
41 Cooperative Performances vs. Expectations

RATIO	GENERAL EXPECTATION	BASE NO. COOPERATIVES	PERCENTAGE	
			EQUAL OR BETTER	BELOW EXPECT.
1. Plant-Revenue Ratio	12:1	39	51%	49%
2. Debt Service Coverage	100%	40	58%	42%
3. Consumer per Km. of Line	50 - 55	27	78%	22%
4. KWH Sales per Km. of Line	30 - 40,000	26	62%	38%
5. Investment per Consumer	₱ 1-2,000	41	85%	15%
6. Non-Power Operating Expense per KWH	₱ 0.10	41	56%	44%
7. System Loss	20%	41	66%	34%
8. Percent of Billings collected	90%	33	67%	33%

Table No. 10

Investment Indicators for  
11 Strongest Cooperatives  
(as of May 1977)

	NUMBER OF CONSUMERS	PRR	(% DSC	PER KM. OF LINE		(pesos)	OPERATING EXPENSE* PER KWH (Centavos)	(% SYSTEM LOSS	PERCENT COLLEC- TION
				CONSUMERS	MWH	INVEST- MENT PER CONSUMER			
NEA Expectation	50,000	< 12:1	100	50 - 55	30-40	< 2000	10	20	90
Benguet	13,723	1.8	1645	85	369	518	1.5	18	85
La Union	17,290	6.5	257	81	65	641	6.6	18	92
Bataan	23,637	5.2	364	102	103	618	5.2	29	114
Zambales	15,371	10.8	321	111	80	669	8.0	12	85
Tarlac	9,743	6.4	250	99	55	546	12.1	23	90
N. Ecija I	19,938	6.4	178	42	31	748	9.4	28	108
Pampanga	44,214	5.3	189	72	50	408	7.0	18	92
Sapang Palay	4,555	5.4	517	127	92	625	8.1	4	60
Laguna	13,928	6.1	137	127	85	497	6.8	11	88
Albay	11,977	8.7	365	66	37	742	13.6	22	-
Zamboanga City	10,877	6.8	362	272	494	1013	5.4	29	100

\* Exclusive of generation expense.

d. NEA Relending Policy. The basic concept in allocation of funds at the most concessional terms has been that the high initial investment in backbone primary lines and in general plant needs the softer terms, while future expansions can be made on harder terms. The estimated total requirement for these lines is ₱1,830 M (\$244 M) committed to the cooperatives by NEA of this amount ₱1,400 M or 75 percent of the backbone requirement.

Alternatively, lower interest rate loans can be used to support a certain initial percentage of the potential connections as well as to fund headquarters facilities. There are presently 6.3 million households that eventually will be served by 118 cooperatives. Variations in the percentage to be served at softer terms and in the cost per connection are tabulated below:

Table No. 11

Entitled to Soft Terms	Distribution Costs		Head-quarters at ₱2M ea.	Total Investment Required		Loans Committed	Balance of Requirements		
	IN MILLION PESOS								
Per-Cent	('000) House-holds	At ₱1500 Ea.	At ₱1000 Ea.		At ₱1500 Ea.	At ₱1000 Ea.	At Soft Terms	At ₱1500 Ea.	At ₱1000 Ea.
25	1,575	2,363	1,575	240	2,603	1,815	1,400	1,203	415
33	2,080	3,120	2,080	240	3,360	2,320	1,400	1,960	920
50	3,150	4,725	3,150	240	4,965	3,390	1,400	3,565	1,990

Assuming that cooperatives will be loaned funds at soft terms to finance 33% of their potential connections, and that connection cost will be close to ₱1,500, then another ₱2 billion is soft loan commitments need to be made.

Within rather broad limits, NEA can continue offering low interest rates to cooperatives. If one-third of potential consumers were to be connected up using soft-term financing the total fund \$100 M may be the USAID input (including this proposed RE V); \$34 M would come from other bilateral sources (Japan and Germany) and \$91 M from international lending institutions. The balance of \$225 M would be Philippine government input as capital contribution to NEA. Cost and returns are tabulated on the following page.

Table No. 12

<u>Incoming Funds</u>				<u>Outgoing Funds</u>			
<u>Dollar Sources</u>	<u>(\$M)</u>	<u>Annual Costs</u>		<u>Loans to Co-ops (\$M)</u>	<u>Annual Returns</u>		
		<u>: Interest Rate :</u>	<u>: Amount \$M :</u>		<u>: Interest Rate :</u>	<u>: Amount \$M :</u>	
AID	\$ 100	: 3	: 3	Grid-Connected \$360	: 3	: 10.8	
Other Bilateral	34	: 3.5	: 1.2	Self-Generating 90	: 2	: 1.8	
IBRD/ADB	91	: 9	: 8.2		:	:	
Sub-Total	\$ 225	: 5.5	: 12.4		:	:	
<u>Peso Sources</u>	<u>\$ 225</u>	<u>: -</u>	<u>: 0</u>		<u>:</u>	<u>:</u>	
Total	\$ 450	: 2.75	: 12.4	Total	\$450 : 2.8	: 12.6	

On the \$450 M of loans at soft terms, the blended financial cost is roughly 2.75 percent per annum, while the financial return is 2.8%. For the balance of population to be electrified after disbursement of the \$450 million equivalent, interest rates will have to be adjusted. The blended cost using international banks funding and Philippine government contributions will be in the range of 4 - 5%, this is the minimum target for a composite rate of return.

It is the present NEA policy to give Peso loans to self-generating Cooperatives at 2% for 35 years including a 5-year grace period, and to cooperatives connected to the NPC national electric grid at 3% for 30 years, including a 5-year grace period. The more concessional terms for self-generating cooperatives is to compensate for their larger initial capital investment and the higher operating costs.

## FINANCIAL RETURN

To estimate the financial return on the investment anticipated under the project, the financial data for a hypothetical cooperative have been projected from year 0 through 24 (Table A). As it is impossible to identify exactly how A.I.D. funds will be used, it is reasonable to develop this "representative" cooperative whose revenues and costs are derived from historical relationships established by NEA cooperatives in general.

More specifically, the entity analyzed is composed of the typical cooperative population: 79% of total connections are residential, .02% industrial, 11% commercial, 9% street lights, and .4% public buildings. The actual number of connections beginning in year 1 are determined by historical observation; for each \$1 invested, an expected number of connections occur in each category during the first year and continue to increase through year 10. Likewise, KWH usage per category, per connection, is determined on a historical basis and increases at a rate of 4% per year. Revenues and costs are then based on total KWH consumption per category. For more detail, see the section on "economic analysis".

Table A indicates that the expected financial internal rate of return is approximately 20%. If operating and investment costs are 25% higher than anticipated (Table B), the IRR is still a reasonable 10%. As both of these returns are calculated without considering A.I.D.'s concessional financing terms, which would make the IRR considerably higher, the project appears to be a very attractive financial investment.

TABLE A --- FINANCIAL ANALYSIS

<u>YEAR</u>	<u>INVESTMENT COSTS</u>	<u>O &amp; M COSTS</u>	<u>POWER COSTS*</u>	<u>TOTAL COSTS</u>	<u>DIRECT BENEFITS</u>
0	3.080	.092	0	3.172	0
1	2.200	.158	.352	2.710	.586
2	2.860	.244	.923	4.027	1.538
3	1.870	.300	1.636	3.806	2.727
4	.990	.330	2.303	3.623	3.839
5	0	.330	3.023	3.353	5.038
6	0	.330	3.789	4.119	6.315
7	0	.330	4.440	4.770	7.400
8	0	.330	5.104	5.434	8.506
9	0	.330	5.738	6.068	9.564
10	0	.330	5.996	6.326	9.994
11	0	.330	6.201	6.531	10.335
12	0	.330	6.461	6.791	10.768
13	0	.330	6.760	7.090	11.266
14	0	.330	7.019	7.349	11.699
15	0	.330	7.316	7.646	12.196
16	0	.330	7.616	7.946	12.693
17	0	.330	7.930	8.260	13.217
18	0	.330	8.285	8.615	13.808
19	0	.330	8.639	8.969	14.399
20	0	.330	8.954	9.284	14.923
21	0	.330	9.354	9.684	15.590
22	0	.330	9.794	10.124	16.324
23	0	.330	10.166	10.496	16.943
24	0	.330	10.558	10.888	17.596
	<u>11.000</u>	<u>7.724</u>	<u>148.357</u>	<u>167.081</u>	<u>247.264</u>

Internal Rate of Return - 20%

\*Includes Administrative Costs

TABLE (B)  
FINANCIAL ANALYSIS - COSTS INCREASE

<u>YEAR</u>	<u>INVESTMENT COSTS</u>	<u>TOTAL OPERATING COSTS</u>	<u>DIRECT BENEFITS</u>
0	3.850	.115	0
1	2.750	.638	.586
2	3.575	1.459	1.538
3	2.338	2.420	2.727
4	1.238	3.291	3.839
5	0	4.191	5.038
6	0	5.149	6.315
7	0	5.963	7.400
8	0	6.793	8.506
9	0	7.585	9.564
10	0	7.908	9.994
11	0	8.164	10.335
12	0	8.489	10.768
13	0	8.862	11.266
14	0	9.186	11.699
15	0	9.558	12.196
16	0	9.933	12.693
17	0	10.325	13.217
18	0	10.769	13.808
19	0	11.211	14.399
20	0	11.605	14.923
21	0	12.105	15.590
22	0	12.655	16.324
23	0	13.120	16.943
24	0	13.610	17.596

IRR = 10%

## C. SOCIAL ANALYSIS SECTION

### 1. Introduction

The Rural Electrification Program is a massive undertaking both in terms of the financial resources that are being directed to the rural areas and also in terms of the magnitude of the impact that RE is having on the countryside. This impact ranges from the direct benefits to the rural poor from household connections, to increased employment and productivity, better education opportunities and improved medical care as a result of electrification. Additionally, farmer productivity is increased through the use of electric motor driven water pumps to control and supply additional irrigation water. Employment opportunities also increase from the increase in food production.

The social benefits of the RE Program are not exclusively production employment, or consumer oriented either. The rural electric cooperatives are massive training programs involved in a social democratic movement which directly involve cooperative member/owners and others participating in their own development. This movement will have enormous impact on rural life and society.

### 2. Participation of the People in Rural Electrification

The cooperative movement in the Philippines has had a long, painful history of failures. In the past Government attempts to institute cooperatives in the rural sector, fully supported by AID, failed miserably, and almost completely in every attempt. So it was not without some misgiving that AID viewed the formation of RE System based on the cooperative system and organization.

The GOP considered, correctly as the years passed, that in order for RE Program to be successful the strong support and participation of the people in its own development had to be encouraged. Only the cooperative structure and philosophy, provided an organizational system for this support and participation. The GOP correctly viewed that despite the failure of past cooperative movements, only the cooperative system provided the consumer equity and social, political and economic participation.

The RE cooperatives follow the general principles of Cooperative System. Peoples' participation are encouraged in every phase of the development of the electric system. AID's Rural Electrification IV Project Paper described, in some detail the participatory nature of the pre-operational stage of cooperative institutional development through

the use of the Provincial Electric Cooperative Team (PECT), and described at some length the diverse nature of newly formed cooperative Boards of Directors. From this analysis we saw that the Boards of Directors were not made up of the traditional power structure, but were largely representative cross sections of what might be considered respected, unofficial, community leaders, e.g. school teachers, clergy, retired professionals, etc.

In the operational phase of cooperative development the peoples' participation is encouraged at every feasible juncture. Before cooperatives were energized, cooperative members canvass potential connections sources and help plot the location of transmission lines, substations, headquarters and other cooperative facilities. Cooperative members hold right-of-way meetings to discuss operational problems, access, and other community interests in the location of electric facilities. When the cooperative advances to the construction phase, cooperative members offer assistance in construction, organizing and planning the implementation of the project.

Within the cooperative structure the General Assembly is the legitimization of the ownership and participation of the people in the cooperative. Cooperative Boards of Directors, the official leaders of the cooperative, are elected at the General Assembly meetings. At the General Assembly the people provide general guidance and recommendations to their cooperative leadership. General Assembly recommendations and motions are written from the minutes of these meetings, and reports on progress made toward carrying out recommendations presented at future meetings.

The support and sense of responsibility that the RE Cooperative System encourages from its members is an invaluable asset. The established credibility of cooperative, to meet their objectives and their own obligations to maintaining the system is extremely important to the organization. The organization of the cooperatives and the guidance they receive from NEA is calculated in every way possible to encourage the autonomy and responsibility of cooperative members. A passage from a yet unpublished manuscript of Mr. Frank Denton\* illustrates this sense of responsibility and the organizational structure which has permitted, if not promoted, the rapid progress of the RE Systems:

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\*Mr. Denton is an AID Officer who was stationed in the Philippines during the initial development of the RE Program. His yet untitled manuscript documents the process of Philippine RE Program.

"These communities were quickly absorbed in the problem of getting prepared. Concrete foundations had to be in place, covers erected and provisions made for unloading and moving by land the large, heavy generators despite inadequate port and road facilities. Bridges had to be strengthened and roads widened in spots. Rather than the community waiting for the Government to act, the community was being pressured, very hard, to get local facilities ready so that the program would not be delayed. The local people were in no position to complain that the center was delaying things; they were struggling like mad to keep their heads above the deluge of actions which they had to take to meet their end of the bargain."

General Assembly elections are conducted annually in the energized cooperatives. In addition to the annual assembly meetings, district electric meetings are held to elect district representatives to the Board of Directors, and to ensure widespread representation of cooperative membership. Board meetings must be held at least once a month to review cooperative progress. Special membership meetings can be called at any time by any cooperative member or director to review problems of special or immediate concern.

The cooperative system is formulated to protect cooperative members from unscrupulous or ambitious elements within the leadership. The annual elections at the general assembly and district offices provide a direct mandate from the people to its leadership. These elections do not appear to be merely pro forma rituals to fulfill the written by-laws of the cooperatives. From a review of the leadership turn-over of the Boards of Directors there appears to be active and substantive participation of cooperative members. (See Annex B-5).

There are other social concepts promoted by the RE coops that are just as much a part of the cooperative systems as they are part of the thorough administration and implementation of NEA. The RE Program is a massive training ground for members, cooperative leaders, workers and managers. Annually NEA and the cooperatives hold training for cooperative personnel and membership in many aspects of the operations. Training is carried out in technical and managerial areas as well as in concepts of peoples' participation, community action, leadership, and political and social responsibility. This training is conducted regularly by NEA, by contractors, and by

the cooperatives themselves. As of December 31, 1976, approximately 20,000 people have received training from NEA. For a detailed listing of trained cooperative personnel refer to Annex B-6.

This massive training program, plus the on-the-job experience for cooperative leaders, managers, members, technicians alike, will have an enormous impact on the Philippines.

In addition to the training that is provided by NEA to rural electric cooperatives and the training programs set up between cooperatives, NEA has been providing international training courses to assist other countries within the region with the institutional and technical development of their own RE Program. To date, international training has been conducted for groups from Bangladesh, Indonesia and Pakistan. Three seminars have been held, and there are plans to conduct at least 2 more seminars in each of 1977 and 1978. Training has been offered to government ministers, directors and technical experts and cooperative managers and other personnel from participating countries in subjects such as planning, organization, administration of rural electric programs. For a complete description of the training courses offered in 1977, refer to Annex C.

The participants of the international training courses held by NEA constitute an extremely important beneficiary impact of the program. The participants constitute international beneficiaries of the project that will have an impact on the electrification programs in other countries. In 1977, NEA has offered approximately 70 person months of training to 35 international participants. Plans are now being carried out to expand this training to other areas so that other countries in the region can benefit from NEA/Philippine experience.

### 3. Beneficiaries

Households are the largest consumers of electricity. However, a substantial proportion of electricity is also provided to small industry, commercial stores, small farmers and to social entities such as schools, medical buildings and other institutions that provide social services.

It is extremely difficult to quantify this group of electrical power beneficiaries and it is also equally difficult to estimate the participation of the rural poor in the benefits derived from cooperative power to these groups. However, benefits from service connections for education, industry, farming and improved medical attention accrue to the poor regardless of whether they have household connection or not.

In coop electrified areas one of the most frequent self help projects assisted by the rural electrification program is the electrification of the public school houses. As of April, 1977 over 4,000 schoolrooms in approximately 600 public schools have been electrified. Electrification of schoolrooms has resulted in numerous advantages.

Electrification allows study at night and permits schools with a shortage of classroom capacity to increase the utilization of their classroom space. Night classes also permit the underprivileged, the school drop out, and undereducated adults to work during the daytime and attend school during the evenings.

Electricity promotes improved teaching and learning. Previously vocational classes and other technical courses were seriously handicapped by a lack of electricity to carry out their course work. With electrification in the rural areas vocational and technical courses are improved.

In some of the poorer communities the public schoolhouse is the only building large enough to conduct public meetings. Electricity allows these meetings to be held during the evening without disturbing education during daylight hours and insuring a higher rate participation from the community since it is not necessary to forego daytime work to attend.

One of the additional spinoffs from the Rural Electrification Program is the effect that electrification has had in general on the stimulation of small industry in rural areas. Small entrepreneurs have found that, as a result of the availability of power, they can compete more effectively with other businesses in larger urban centers if electricity is available to run equipment and tools. The overall effects of RE Program on the stimulation of business activity and small industries in the cooperative areas can only be estimated at this time. Additional information will be available from special studies to be conducted in the future. (See evaluation section).

In most cases, small industry hookup is encouraged by rural electric cooperatives to balance out distribution system loads. However, the general practice, in areas where surplus power is not readily available, is to exclude existing large industry from cooperative power and provide as much power to residential and small consumers as possible. The larger industrial undertakings, in these cases, generate their own electric power. The Small Industry Electrical Consumption Table No. 13 on the next page, shows that power consumed by industry is relatively low. The amount of

cooperative-provided power consumed for industrial uses ranges from 4.4% to 26.8% of total consumption. This table demonstrates that the cooperatives are providing power to small industry, but also maintaining their residential constituency.

Table No. 13

SMALL INDUSTRY ELECTRICAL CONSUMPTION

<u>COOPERATIVE</u>	<u>REPORT MONTH</u>	<u>INDUSTRIAL NO. OF CONN.</u>	<u>INDUSTRIAL KWH SALES ('000)</u>	<u>TOTAL KWH SALES</u>	<u>AVE. CONS. PER INDUSTRY ('000)</u>	<u>% OF TOTAL CONSUMPTION</u>
1. Bulacan	Feb. 76	75	257	1288	3	19.95
2. Laguna	Feb. 77	25	163	829	7	19.66
3. Zambales	Feb. 77	7	58	1324	8	4.38
4. Western Pang.	Mar. 77	5	53	247	11	21.45
5. La Union	Mar. 77	26	195	727	7	26.82
6. Camarines Norte	Mar. 77	32	77	369	2	20.86
7. Iloilo	Mar. 77	24	69	269	3	25.65
8. Leyte	Feb. 77	2	59	273	29	21.61
9. Negros Occ.	Dec. 76	9	209	1513	23	13.81
10. Misamis Oriental	Feb. 77	3	75	869	25	8.63
11. Lanao del Norte	Mar. 77	3	205	527	68	38.89
12. Lanao del Sur	Jan. 77	1	107	744	107	14.38
13. Zamboanga City	Mar. 77	7	154	1998	22	7.70
				10977		15.31

Annex B-7, Commercial and Industrial Consumption, shows that after initiation of the electric cooperative in an area the demand for electricity for small industry uses and the number of small industry hookups also increase dramatically over time. For Bulacan I Cooperative, the provision of power to small industry triples while the number of small industry consumers doubles in three years.

While summary information contained in Annex B-7 is handicapped by the lack of complete data on small industry consumption and use of electricity, some general observations can be made. From the data available there appears to be a very close relationship between the provision of electricity and small industry. On the basis of this preliminary data, it is reasonable to conclude that the RE program stimulates the creation of new small industry in rural areas.

Whatever the case, the growth in consumption of power occurs rapidly. The assumption is that as a result of the stimulation of small industry or as a result of the increased power consumption employment opportunities in rural areas are increased.

For additional breakdown of cooperative load by uses please refer to Annex B-2, excerpts from La Union, Benguet and Pampangã Electric Cooperatives Five-Year Plans. Similar Five-Year Plans are being developed by other cooperatives. Complete plans for these three cooperatives are on file with ASIA/PD and represent the initial development of medium range planning at the cooperative level.

#### 4. Agricultural Uses of Electricity

Electricity has provided the farmer with innumerable opportunities to improve his income and increase his production. One of the largest uses of electricity for agricultural purposes is for irrigation. NEA, using electric motor driven water pumps, has assisted farmers within the cooperative service areas with financial and technical assistance necessary for the installation of water pumps. Generally, these installations are made only to farmers' associations with from 15-100 farmers participating in each association. As of December, 1976 rural electric cooperatives had provided electricity to over 400 small scale pump irrigation systems, providing water to over 34,000 hectares of rice paddies. NEA has directly assisted the farmers with financing for the purchase of the pumps and motors for over 200 systems and have helped the farmers organize the associations. In addition to NEA-assisted irrigation projects, many times this number of irrigation systems have been initiated by the private farmer and other groups without NEA assistance.

Aside from increased productivity resulting from irrigation, there is an increase in the employment opportunities to rural farm workers. Irrigation not only provides the opportunity for improved yields, but also the opportunity of increasing the frequency of plantings which provides more work for the unemployed. The increased production requires more laborers, more millers and processors and transportation and more of everything on down the economic line. Electricity is stimulating agricultural economic activity in these areas and providing employment and other benefits in every aspect of rural life.

5. Partial Results of Beneficiary Analysis - NELCOR Survey

Early in 1976, NEA started a project to evaluate rural electrification in the Philippines using a nationwide sample survey as the main instrument. Objectives, hypotheses, and a questionnaire were formulated, table formats and operating manuals were drawn up. In October 1976, a contract was awarded with a private research group, the Asian Research Organization, to undertake the data gathering and data processing. After pretest and final revision of the questionnaire, actual interviewing started in January, 1977. By early April the computer printouts were available and analysis commenced. In addition to the services of PASA-provided technicians from the U. S. Bureau of the Census, NEA has contracted for the services of two Filipino consultants to provide technical supervision to the analysis, undertaken in-house by NEA's staff. This analysis is currently in progress.

The nationwide survey involves approximately 4,000 households in fourteen provinces. Respondents come from 27 towns served by 14 electric cooperatives and from 27 matched towns served by noncooperative utilities or without electricity.

The cooperatives surveyed, number of months in operation, their number of consumers and average system tariff are tabulated below:

Table No. 14  
Residential Rates (As of April 30, 1977)

	<u>Months in Operation</u>	<u>Number Consumers</u>	<u>Average Tariff Residential (ctvs)*</u>
La Union	33	16,436	35
Western Pangasinan	17	4,706	42
Zambales	28	16,949	38
Bulacan I	46	25,377	37
Laguna	44	11,045	37
Quezon	13	5,590	50
Camarines Norte	12	6,264	69
Leyte	47	8,507	70
Iloilo	29	6,677	68
Negros Occidental	68	15,508	65
Misamis Oriental	67	9,002	15
Lanao Norte	28	7,847	19
Lanao Sur	44	7,847	20
Zamboanga City	37	11,069	56
		<u>89,672</u>	Ave. <u>44</u>

\*One Philippine centavo = US 0.13 cents.

a. Profile of Beneficiaries

From the nationwide survey, a distinct profile of cooperative consumers can be developed. A significant portion of them are poor: 40 percent live in houses made of light materials; 15 percent do not, in fact, own either the house or lot in which they reside. 45 percent obtain their drinking water from outlets located outside of their houses, i. e., wells, springs, rivers or rain; 67 percent of consumers have been connected up to the system since 1972; 32 percent use 15 KWH of electricity per month or less; and 38 percent pay less than \$1.33 (P 10) for electricity. (Note: This last statistic is a significant indicator that the poor majority is being reached directly.) The survey data shows that consumers, generally have positive attitudes toward their area and specifically towards their cooperatives: 69 percent of the respondents have perceived economic change in their area since electric service was provided; 82 percent believe peace and order has improved, and 74 percent believe that there is an increase in educational activity; 87 percent of the consumers have confidence in cooperative management. They believe 7 to 1 that service is adequate; 3 to 1 that repairs are made promptly and 5 to 4 that electric rates are reasonable.

Users of electricity in cooperative areas averaged 2.8 sources of income per household. Major sources of income were wages and salaries in non-agriculture, (58% of the households), followed by livestock and poultry (56%), farming (44%) and practice of trade or profession (42%). One out of five households claimed to use electricity for some commercial purpose, 48 percent of heads of electrified households have not gone beyond elementary school.

Cooperative members are beginning to experience the comforts of "living electrically". Among 1,013 consumers, the count of the five most popular appliances (flat iron, electric radio/stereo, TV, electric fan and refrigerator) came to 1,720. There were nevertheless, a total of 3,640 claims to have used these appliances, including 1,403 claims from non-electrified households by using their neighbors' appliances. Six hundred fifty-five non-electrified households claimed to have watched TV; 202 used a flat iron, and 131 a refrigerator. Only nine percent of consumers used more than 100 KWH per month, so ownership of appliances can be considered widely dispersed; and in the spirit of neighborliness, the use of these appliances are shared.

b. Unelectrified Households

Some 35% of households in the cooperative areas are presently electrified, with 10% of potential household in an area being added each year. Unelectrified households, are somewhat poorer on average than households presently electrified. Eight out of ten households live in small groups outside the main rural population centers. Eight out of ten households live in houses made of light materials (grass, plywood, etc.) and 18 percent own neither house nor lot. At a hypothetical monthly bill of \$3.33 (P25) 46 percent of the unelectrified households stated they definitely would not connect; at \$1.33 (P10), the figure drops to 23 percent. However, it should be noted that minimum billing averages about US \$0.67 (P5), much below either hypothetical question.

Unelectrified household residents are more poorly educated, participate to a lesser degree in family planning and have less positive attitudes. Their most positive responses are to improved peace and order (62%) and electricity being good for the area (79%). Fewer of them own beds and other household items.

The relatively negative picture presented by unelectrified households is based on two factors: (1) the implementation plan of area coverage, whereby more substantial loads are developed, initially, in order to later on financially support weaker loads or areas (specifically, the relative concentration on large villages and more accessible small villages at the start of the program); and (2) the existence of a significant fraction, about one-third of all cooperative consumers who had electricity prior to the cooperative coming in, through private franchise systems, although such service was of higher cost, shorter duration and poorer voltage. Full area coverage will take some fifteen years to achieve.

c. Comparison with Unelectrified Households in Non-Cooperative Areas

Unelectrified households in cooperative areas are not only poorer than electrified households, they are also poorer than unelectrified households in non-cooperative areas. Only 21 percent of these will not connect at \$3.33 (P25), and only 9 percent will not connect at a monthly bill of \$1.33 (P10). On the other hand, the unelectrified cooperative residents are much more optimistic than their counterparts in noncooperative areas, by a factor of 2 to 1 for economic activity, peace and order and educational activity.

Only 38 percent of nonelectrified noncooperative residents believe that electrification is good for their areas; on the other hand 90 percent would like a cooperative to provide service.

d. Threshold Income

Threshold income has been defined as the level of income below which a household cannot afford to take service. The concept bears explanation, especially considering that the Philippine program aims to electrify all households interested in obtaining service. In relation to the "definitely will not connect" figures above in response to hypothetical questions regarding levels of minimum billing, it may be observed that in most of Luzon and Mindanao, the minimum bills of cooperatives average \$0.67 (P5). In the Visayan regions, eight out of thirteen cooperatives have minimum bills below \$1.33 (P10). Hence, although 23 percent of the unserved households (15% of all cooperative areas households) would not connect at \$1.33 (P10), it follows that some smaller number would not connect at \$0.67 (P5) or some other intermediate minimum bill. If incomes grow faster or even proportionately to the cost of electricity the percentage that "definitely will not connect" should diminish. It is possible that all households will want electric service by 1990, the target date for total national electrification.

By and large, the present experience of cooperatives is that they have longer waiting lists of applicants than can be serviced. Service is constrained by limitations of the RE program funding availabilities and generation capacity.

Direct survey findings on threshold income are somewhat ambiguous. The University of the Philippines-Iloilo study of the Iloilo Electric Cooperative found, for instance, that for the group of new electricity users living in rural villages, of whom 90 percent were minimum bill users, the median income was \$6.75 (P50.54) per capita per month. This was designated as the "threshold income".

The University of the Philippines-Baguio Study of the La Union Electric Cooperative, on the other hand, did not produce a value for "threshold income". A comparison of the 20 lowest-income non-adoptors and the twenty lowest-income adoptors and six non-adoptors disclosed that while the mean incomes were significantly different, six of the adoptors had incomes below the average for the non-adoptors and six non-adoptors had incomes above the average for

adoptors. Income, the study concluded, was probably not a major factor in the decision of whether or not to connect.

On the nationwide survey, production and income data are not presently tabulated for analysis. Surrogate statistics, such as location, housing materials, education and household items owned do show significant differences between electrified and non-electrified households, but as in the case of UP-Baguio there are significant overlaps. As for instance, in housing materials, where 40 percent of the electrified have the poorest housing, or in non-ownership of household items, where 20 percent of the electrified have neither books nor beds in the house, and in education, where 11 percent of household heads had no more than two years of schooling. Tentatively to take the lowest 10 percentile, it may be assumed that where all the following factors exist: (a) a household is located in an interior village; (b) a household head has no schooling; (c) housing is of light materials and owned by others; and (d) the household owns neither books nor bed that, there is a strong possibility that it may not be interested in, or be able to afford electricity.

e. Comparisons between Cooperative and Non-Cooperative Electrified Areas

Non-cooperative electrified areas generally have been electrified for a longer period as the following table shows:

Table No. 15

Percent of Connections by Date of Connection

<u>Date of Connection</u>	<u>Cooperative</u>	<u>Non-Cooperative</u>
Before 1960	8.3	21.1
1960 - 1969	16.6	23.1
1970 - 1973	21.0	29.4
1974 - 1977	<u>52.6</u>	<u>24.4</u>
Total*	98.5	98.0

\*balance of 100% were "don't know" responses.

Non-cooperative utilities also have served denser and more attractive areas; and have barely penetrated interior small villages"

Table No. 16

Interior Small Villages

<u>Respondents</u>	<u>Cooperative</u>	<u>Non-Cooperative</u>
From interior villages	712	168
Electrified	150	4
% of Sample from Villages	24%	17%
% of Villages Electrified	21%	2%

The cooperatives have relatively larger hinterland population, and in spite of the fact that cooperative electrification is more recent, have made much greater inroads into these areas in terms of electric connections.

The typical electrified household in non-cooperative area has a higher living standard than an electrified cooperative household. Only 27 percent have housing of light material. Eighty percent use more than 15 KWH per month.

f. Consumers' Awareness of and Preference for Electric Cooperatives

In cooperative areas, 70 percent were aware of the presence of the electric cooperative. In non-cooperative areas nine percent mistakenly thought that an electric cooperative was providing service. At the same time 81 percent of non-cooperative consumers and 90 percent of other non-cooperative area residents, indicated their desire for an electric cooperative to serve their area.

Cooperative residents also have more definite positive feelings towards electricity and they (electrified/non-electrified) consider the cost of electricity about right or low (55%); the figure is 44% in non-cooperative areas.

## 6. Role of Women

Women are well-represented at all levels in the cooperative program. In NEA itself, the corporate auditor is a woman, as are the chiefs of local procurement and of training, the public relations officer, and the NEA Board secretary. Women are chiefs of 7 of 28 divisions and head 17 of 80 sections. Women are involved managing small-industry cooperatives, undertaking electrification of barrio schoolhouses, reviewing electric system designs and advising on tariffs and financial planning.

Within the electric cooperatives women play key roles. While rural Philippines still give greater scope to the men, there are a limited number of women on cooperative boards; 15 female directors in 66 operating cooperatives. On the cooperative staffs, normally women tend to undertake accounting, bookkeeping and office management functions. However, some cooperatives have female engineers and design staff. In one cooperative, women work together with their male counterparts as electricians.

Various cooperatives receive strong political and moral support from female political leaders in recognition for the positive impact on women. Women are also actively involved in the District Electrification Committees. Women attend and speak out at the annual general and district meetings, and elect their directors. With such decisive and significant roles, and also considering the traditional role of women as the family treasurer (and therefore payor of electric bills) it can be said that it would be impossible to implement the rural electrification program without the participation and cooperation of women.

Filipino women are also very instrumental in utilizing benefits that can be derived from adequate and reliable electric service by the cooperatives. The electrification project, as can be observed, is especially beneficial to women. To begin with, the great majority of the connections are for dwelling units - and one cannot discount the impact of electricity in the homes. Electric lighting for the home which ranks highest among the rural residents' desired uses of electricity surely contributes to the women's feeling of security when the husband and other male members of the house are away at night.

Secondly, the availability of electricity allows the Filipino women to enjoy the conveniences of modern living. The electrical

appliances they use partially frees them from the drudgery that they face daily in managing the house. An electric iron is much easier, quicker, and cleaner to use than the traditional iron heated by charcoal. A refrigerator protects the food from spoilage and provides a means of string vaccines and anti-toxins, thus improving the mothers' ability to take care of their families.

Thirdly, power-using projects in the rural areas provide women opportunities for economic advancement. The "sari-sari" stores (small variety stores) popular in these areas are normally operated by women. With electric refrigerators, they can sell cold refreshments and can store goods with short shelf life, thus increasing the variety of products they have for sale. Moreover, the labor-intensive small scale, primary assembly, or light manufacturing industries that are established in the rural areas after electrification offer job opportunities to women. The garment industries set up in Capiz and Laguna, the weaving industry in Benguet, the embroider-apparel industry in Bulacan, the piña cloth industry in Aklan and the fibercraft industry in Pampanga employ large numbers of women. The money they earn help them in augmenting the family income.

Fourthly, the electrification program through the schoolhouse lighting project, makes room for the educational advancement of women. The adult education and vocational courses offered by the lighted schools allow mothers and other women who are tied up to their house duty during the day to study at night. Consequently, their additional knowledge makes them more qualified for employment.

Special beneficiaries that they are, the Filipino women thus indirectly promote and are key beneficiaries of the electrification program. As such, they ultimately encourage their countrymen to participate and get involved with this government-spurred program. It is the Mission's conclusion that women as implementors and beneficiaries have emerged as a potent force in the rural electrification program and in the country's overall socio-economic development as well.

D. PROJECT ECONOMIC ANALYSIS

Summary and Conclusions

Given that one of the Government of the Philippines' objectives is to strengthen and expand the country's infrastructure and rural development, and that the country's resources ---particularly energy power and capital --- are limited, the economic analysis will appraise this rural electrification project in terms of whether it achieves most in terms of the country's objectives. This was done by drawing on our experience in previous rural electrification projects in the Philippines, and by projecting the inputs and outputs in accordance with the total costs of this project.

Project economic costs are defined relative to their marginal opportunity cost, which is the loss in output, in the present marginal use of the input, that would result if the marginal unit of the factor of production were transferred to the project. The present value of the project economic costs is US \$30.0 million equivalent.

Project economic benefits are defined relative to their effect on the fundamental objectives of the economy, namely rural development and foreign exchange saving. This analysis has quantified only those benefits that can realistically be valued in monetary terms and for which base line data is available.

The project will produce substantial direct and indirect benefits. Power tariffs recover some quantifiable benefits which we call direct, and their present value amounts to US \$35.0 million equivalent. Other quantifiable benefits, indirect, stem from kerosene cost savings (lighting), cost savings in running home appliances, and sale of refrigerated products. The present value of indirect benefits amounts to US \$6.8 million equivalent.

Current estimates indicate that the country's internal economic rate of return (IERR) on alternative investments lies somewhere between 10 percent and 15 percent; this analysis uses the highest figure.

The project was subjected to three of the most commonly used primary tests of value: the benefit-cost ratio, the net present worth, and the internal economic rate of return.

The benefit-cost ratio is 15 percent is 1.4, indicating that the project is acceptable in terms of generating benefits in excess of costs. That is, for every \$1.00 spent on rural electrification, the country will derive \$1.40 in benefits (refer to Table 12, Annex K).

The net present worth, when discounted with an opportunity cost of capital of 15 percent, is US \$11.8 million; that is, US \$11.8 million will be generated over the useful life of the project, after all economic costs are covered, including the opportunity cost of capital (refer to Table 12).

The internal economic rate of return to the project is 30 percent, which compares very favorably to the 10 percent to 15 percent rate of return accruing to alternative investments in the Philippines (refer to Table 12).

Because in every economic analysis there are considerable possibilities for making mistakes in estimating costs, and especially benefits, we have re-worked the analysis to see what happens to the project under more adverse circumstances (such as costs overrun and failure to reach the intended number of beneficiaries).

We have subjected the project to the situation in which the price of the inputs (costs) was either underestimated or that the project would suffer a 25 percent costs overrun on a yearly basis (over and above price contingencies). Under this circumstance, the project's IERR decreases from 30 percent to 20 percent; still well above the prevailing 15 percent rate of return on alternative investments in the Philippines (see Tables 13 and 14, Annex K).

We have also evaluated the project under the assumption that the benefits were overestimated by 25 percent on an annual basis; that is, that only 75 percent of the expected beneficiaries will be reached every year, over the life of the project. In this case, the IERR falls from 30 percent to 17 percent (see Tables 13 and 15, Annex K). Even though the 17 percent economic rate of return is higher than the opportunity cost of capital, it is important to note that the sensitivity analysis reveals the project to be quite sensitive on the benefit side; that is, the social value of the project rests on the number of beneficiaries that are reached.

On the basis of this economic analysis, the project is suitable for an AID loan to the Government of the Philippines in the sum of US \$8.4 million.

## Methodology

The essence of this economic analysis is the examination of the differences between the availabilities of inputs (costs) and outputs (benefits) with and without the project.

For the purpose of this analysis, shadow pricing has been considered unnecessary since: (i) the foreign exchange rate of the country essentially reflects the market supply and demand, and the absence of significant protectionist measures; (ii) unskilled labor costs will amount to only 3 percent to 4 percent of capital costs; and (iii) the government's net tax revenues from sales of electrical appliances or equipment are inconsiderable.

The values of costs and benefits have been divided by years during the life of the project (25 years), and appropriately discounted over -time to yield present values (at 15 percent). Refer to Table 12.

### Power Demand Forecasts<sup>1/</sup>

Power demand in the project region foresees an increase in revenues from US \$5.0 million equivalent in the first full year of the system's operation (1982), to about US \$16.6 million equivalent, nineteen years later (2001).

The assumption underlying this projection are a 4 percent annual growth in power demand by residential consumers (from 73,000 MWH in 1982 to 133,000 MWH in 2001), industrial consumers (from 70,000 KWH in 1982 to 1,000 MWH in 2001), and commercial consumers (from 25,000 MWH in 1982 to 87,000 MWH in 2001).

These are extremely conservative forecasts since: (i) typically, the annual rate of growth of demand in rural areas is between 10 percent and 20 percent; (ii) because of lack of adequate data, no attempt was made to forecast power demand growth in public services (such as healthcare facilities, educational institutions, government buildings, etc.); (iii) even though literature research indicates that in rural areas average levels of consumption are around 1,000 kilowatt-hours per consumer per year, residential consumers, in our forecast, only reach that consumption level on year 13 in poblaciones (townships), in year 20 in main road barrios (rural centers within 2 kilometers from rural road), and in year 23 in interior barrios (rural centers located over 2 kilometers from rural road; and (iv) although one of the main productive uses of electricity in rural areas is for motive power on farms, this demand source was not considered due to the absence of data.

<sup>1/</sup> See Tables 1, 2, 3, 4, 5, 6, and 7, Annex K)

### Project Cost Estimates

All the resources, both physical and human, that will go into the construction and operation of the project have been identified and quantified.

Project cost estimates are based on current costs but include physical and price contingencies of 20 percent for capital costs (generation, transmission and subtransmission, and local distribution networks); and 15 percent for administration, equipment, operations, and maintenance costs.

The present value of the project total cost is US \$30.0 million, divided as follows:

1. Investment Costs: US \$8.0 million equivalent (disbursed through year 5);
2. Operations and Maintenance Costs: US \$2.0 million equivalent (determined by the standard estimate of 3 percent of investment costs, and computed throughout the life of the project); and,
3. Power Costs: US \$20.0 million equivalent (determined by power demand forecasts and the weighted average of marginal cost of power supply to project cooperatives; also computed throughout the life of the project).

It should be emphasized that our cost estimates have purposely ignored the fact that the costs of service per consumer and per unit of power and energy demand decline in real terms as consumer density increases and as demand increases.

The next Table presents the undiscounted value of project costs.

Table 8.-

- 63-B -

PROJECT COSTS				(Dollars thousand)
<u>Year</u>	<u>Investment</u>	<u>Operations and Maintenance</u> <sup>1/</sup>	<u>Power</u> <sup>2/</sup>	<u>Total</u>
1	3.080	.092	0	3.172
2	2.200	.158	.352	2.710
3	2.860	.244	.923	4.027
4	1.870	.300	1.636	3.806
5	.990	.330	2.303	3.623
6	0	.330	3.023	3.353
7	0	.330	3.789	4.119
8	0	.330	4.440	4.770
9	0	.330	5.104	5.434
10	0	.330	5.738	6.068
11	0	.330	5.996	6.326
12	0	.330	6.201	6.531
13	0	.330	6.461	6.791
14	0	.330	6.760	7.090
15	0	.330	7.019	7.349
16	0	.330	7.316	7.646
17	0	.330	7.616	7.946
18	0	.330	7.930	8.260
19	0	.330	8.285	8.615
20	0	.330	8.639	8.969
21	0	.330	8.954	9.284
22	0	.330	9.354	9.684
23	0	.330	9.794	10.124
24	0	.330	10.166	10.496
25	0	.330	10.558	10.888
	<u>\$ 11,000</u>	<u>\$ 7.724</u>	<u>\$ 148.357</u>	<u>\$167.081</u>

<sup>1/</sup> Estimated at 3 percent of total investment.

<sup>2/</sup> Represent 60 percent of total revenues.

## Project Benefits

This analysis has limited itself to the quantification of those benefits for which sufficient data was available.

Project benefits have been divided between direct and indirect benefits (see Tables 9, 10, and 11, Annex K).

Direct benefits (revenues) are equal to projected consumption times tariffs (P .36 per KWH) throughout the life of the project. Revenue sources were classified as:

1. Residential, in turn divided as follows:
  - a.- those residing in poblaciones (32 percent of population);
  - b.- those residing in main road barrios (34 percent of population); and
  - c.- those residing in interior barrios (34 percent of population).
2. Commercial: determined by the average number of commercial establishments in typical rural villages;
3. Industrial: determined in the same manner as for commercial establishments;
4. Public Buildings: determined as the two previous sources; and
5. Street Lights.

The quantification of direct benefits is presented on Table 9.

Indirect benefits to residential consumers were confined to:

1. The cost saved by not using kerosene for lighting. From such savings were deducted fixed and running costs of wiring, fixtures and fluorescent tubes; and
2. The cost saved by not using more expensive sources of energy for running household appliances such as battery operated television sets

and kerosene run refrigerators.

Indirect benefits to commercial consumers consisted of income increases as a result of the sale of refrigerated products. To arrive at net benefits, the capital and running cost of refrigerators were deducted from gross benefits.

This analysis has demonstrated that a 30 percent IERR will be achieved without quantifying additional indirect benefits of rural electrification. Had we considered the indirect benefits accruing to the industrial sector (such as savings in capital and fuel costs, particularly in the case of rice mills; increased labor productivity; expansion of industries producing electric appliances and fixtures, etc.), and to the agricultural sector, the IERR would be significantly higher.

The quantification of indirect benefits is presented on Tables 10 and 11, Annex K.

PART IV  
IMPLEMENTATION PLANNING

## A. ADMINISTRATIVE ARRANGEMENTS

The administrative arrangements for this loan will be the same as those worked out for previous RE loans.

### 1. Borrower

The Borrower for the proposed loan will be the Government of the Philippines (GOP) through the National Economic and Development Authority (NEDA). In applying for the loan, the following assurances have been given:

- a. GOP will provide local currency and other resources as may be required to enable the National Electrification Administration (NEA) to implement the program on a timely basis.
- b. GOP will absorb any "maintenance of foreign exchange value" risks in behalf of NEA and the rural electric cooperatives.
- c. GOP will provide the loan proceeds to NEA on the same terms as the AID loan.

### 2. National Electrification Administration

The implementing agency for the overall project will be the National Electrification Administration (NEA) which was established in 1969 under the provisions of R.A. No. 6038 and reorganized and expanded in accordance with Presidential Decree No. 269 dated 6 August 1973.

The powers of NEA are vested in a Board of Administrators headed by Dean Alfredo Juinio, Secretary of Public Works, Transportation and Communications. He replaces Mr. Ramon Ravanzo, former general manager of the National Power Corporation who has retired from government service, as Chairman of the Board. The other members of the Board are General Ceferino Carreon (Ret.), Chairman of the Board of Communications, Dr. Jaime C. Laya, Commissioner of the Budget and concurrently Deputy Governor of the Central Bank of the Philippines, Mr. Conrado del Rosario, General Manager of National Power Corporation, and Col. Pedro G. Dumol, NEA Administrator (ex-officio board member).

Col. Dumol has been head of NEA since 1970. He is assisted by three Deputy Administrators who in turn supervise seven directorates. Competence at the Deputy Administrator level is ranked from good to excellent.

NEA's competence at all other levels of the organization continues to improve and there is no doubt as to its ability to implement the GOP electrification program. This performance may be summarized as follows:

Table 17

NEA Accomplishments in Rural Electrification  
Calendar Years 1974, 1975 & 1976

(All Figures Cumulative)

	As of <u>31 Dec. 1974</u>	As of <u>31 Dec. 1975</u>	As of <u>31 Dec. 1976</u>
Value of materials handled (\$000)	13,380	42,550	56,000
No. of electric poles delivered	19,880	74,130	141,060
No. of towns energized	165	301	414
No. of households connected	176,325	298,800	467,900

3. Procurement

Materials to be purchased with the proposed loan will arrive in country beginning April 1978. Depending on the size of the first allotment, arrangements will be made for shipment of commodities in either one half or one third delivery blocks. If the full \$20 M is available to the Program in August, NEA will have an IFB ready in September for commodities valued at approximately \$17.0M to arrive April, June and August, 1978. The \$3.0M balance of the loan will be procured in March of 1978 for arrival in November 1978.

NEA has gained considerable experience in forecasting supply requirements and placing orders. The Project Paper for RE IV contains a standardized computer list of commodities requirements for electrical connections. During the past years considerable emphasis has been placed on the refinement of materials handling procedures. NEA and Stanley Consultants have determined that in order to avoid shortages of commodities during the construction of backbone systems, and rapidly increasing household connections, a \$10.0M in country commodity pipeline is necessary. This pipeline is necessary in order to coordinate the arrival of materials and allow time in country shipment to cooperatives. Though cumulative materials requirements increase significantly through 1981 the size of the pipeline is expected to remain constant indicating that additional refinement of procurement procedures and management of materials will be necessary.

4. Construction

Construction of rural electric facilities will either be completed by independent contractors or under force account of the cooperatives. Normally contractors will be utilized to construct

the backbone, transmission lines and substations. All contractor work follows established competitive bidding. The cooperatives are generally responsible for lateral line construction from the backbone and all household connections.

## B. IMPLEMENTATION PLAN

### 1. General

The implementation plan of the National Electrification Administration (NEA) seeks the attainment of the following objectives:

Short-Range - Establishment of an electric cooperative system in every province in the Philippines by 1977;

Mid-Range - Completion of the backbone systems that will interconnect the towns within each of the major islands in the country by 1980; and

Long-Range - Electrification of all barangays (village, or smallest political subdivision of a town) in the country by 1984 and ultimately total electrification of the country on an area-coverage basis by 1990.

### 2. Short-Range Objective

As of March, 1977, there were 82 organized electric cooperatives in fifty-nine (59) provinces in the Philippines. Of these organized cooperatives, 62 are actually providing service in fifty (50) provinces.

During the remaining period of 18 additional electric cooperatives will be set up in twelve (12) additional provinces. During the same year, twenty (20) more cooperative systems will start to provide actual service to customers in twelve (12) more provinces. By the end of 1977, therefore, there would be 100 organized electric cooperatives in 71 provinces and of these cooperatives, about 86 systems will be providing actual service in 62 provinces. It will be noted that by the end of 1977, except for the Province of Batanes which is composed of a group of small islands some 150 miles north of the island of Luzon and with a population of only 12,000 people, all 72 provinces of the Philippines would have organized at least one electric cooperative.

### 3. Mid-Range Objective

The mid-range objective of NEA is to complete the power backbone system by 1980. Essentially, the backbone system will consist of 3-phase distribution lines that will interconnect the town centers of all 1500 municipalities and cities in the Philippines. If we deduct from the total 1500, the municipalities and cities served

by the Manila Electric Company (MERALCO) and other private franchise systems, the net NEA target would be some 1450 municipalities.

As of March 1977, the backbone systems covers 450 municipalities, of which 375 have new backbone systems. To attain the mid-range objective, therefore, NEA and the cooperatives should extend the backbone system to interconnect about 1000 additional municipalities during the 4-year period 1977-1980.

The yearly targets of NEA for the above mentioned 4-year period are as follows:

1977	-	287
1978	-	278
1979	-	316
1980	-	<u>189</u>
Total	-	<u>1070</u>

#### 4. Long-Range Objective

The long-range objective of the electrification program is to bring electric service to all 34000 barrios of the Philippines by 1984 and to provide electricity to every Filipino by 1990. As of March 1977, electric cooperative systems provide service to 4485 barangays. The target for 1977 is to reach 2500 additional barrios. To attain the ultimate target, 4000 additional barangays must be energized each year from 1978-1984.

By 1990, the projected number of household would be approximately 9.5 million. Estimating that MERALCO and the other private franchise systems will serve around 1.5 million household, the electric cooperative systems all over the country will then be called upon to serve some 8.0 million households (48 million people). As of March 1977, the operating cooperative systems serve 500,000 households (3 million people). The cooperative systems will have connected and served their first million households before the end of 1978, and their second million households by 1980. The electric cooperatives will therefore extend service at an average annual rate of 600,000 households/year during the 10-year period 1981- 1990.

#### 5. Implementation Schedule

##### a. House Connection Projections

Annex B-4 shows the household connection projections through 1981, at which time, electric cooperatives will be serving 2.5 million households or about 15 million people. Each electric cooperative system normally targets the connection of 10% of its respective potential household connections each year, so that full coverage is attained in about ten (10) years from start of operations. This progress rate will enable even those

cooperative systems that will start operating in 1980 to electrify all households in their areas by 1990.

b. Schedule of Backbone Distribution Line Construction

Annex B-4 provides a construction schedule for the backbone distribution lines through 1980. These backbone lines will be 3-phase, 13.8 KV multi-grounded distribution lines. Targeted to be finished by 1980 are some 23,000 kms of backbone lines that will interconnect all 1000 municipalities not yet included in the rural electrification system. From these backbone lines will extend the laterals that will serve the barrios.

c. Projections for Barrio Electrification

Annex B-4 gives the barrio energization schedule, by cooperative and by region. This projection indicates when each of the 118 electric cooperative systems plan to energize barangays within their respective service areas. To meet this schedule, cooperatives must energize barangays at an average rate of 4,000 per year.

d. Transmission Line Construction

Annex B-4 also provides the 1977-1980 construction schedule for transmission lines. Some 6,300 kms of 69 KV transmission lines will be built during the 4-year period indicated. The completion of these transmission lines and the complementary substations will make possible the interconnection of major power plants within the Cooperative systems to form island grids. These island grids will not only result in substantial savings because of the economics of scale, but will also contribute much in insuring the supply of firm, reliable and low-cost power.

c. Implementation Strategy

As was done during the first few years of program implementation, the construction of the backbone distribution system and the transmission lines will be done by contract. An exception to this will be the transmission and distribution systems in the Muslim areas of the country, which will be constructed by force account. The constructions of the laterals and the service drops to the consumer connections will be undertaken by cooperative system employees. The cooperative will obtain the rights-of-way of their lines free of charge. The barrio people will clear the rights-of-way for the laterals and will contribute free labor for digging the pole holes and for hauling the poles and other materials. A standing policy that has effectively hastened actual connections of houses to the system authorizes energization of the barrio line only.

after, at least, 50% of the houses in that barrio have been wired and made ready to receive electricity.

The sequence by which the barrio within a cooperative service area will be energized, the number of households that will be connected and the timetable for line construction are determined by the cooperative Board of Directors. These schedules, along with the other program of the cooperative are discussed with the NEA during the Annual Work Plan Seminar. It is during this seminar that the cooperatives and the NEA jointly decide on the specific activities of each electric cooperative during the upcoming year.

f. Consultants

The engineering design and construction supervision of the physical facilities of each cooperative system are undertaken by four private Philippine Architecture and Engineering (A & E) firms who have gained considerable experience in design and construction of distribution systems during the first 5 years of project implementation. All of these firms are internationally recognized and have proven themselves highly capable. These firms are, in turn, supervised by the NEA through Stanley Consultants, Inc. (a US firm). The present Stanley staff working with NEA consists of five consultants for Transmission and Distribution Systems and one consultant for Warehousing Operations. Present plans call for the reduction of the Stanley staff to four consultants by 1979 and for phase-out of Stanley services by 1980.

g. Program Target by 1981

By 1981 there should be 118 electric cooperatives serving some 1,450 municipalities throughout the country. By that time, together with the National Power Corporation (NPC), Manila Electric Company (MERALCO) and six (6) other private franchised systems, the cooperatives would have established a backbone system serving all the municipalities and cities throughout the country. The cooperatives alone would be serving around 2.5 million households or 15 million people. During that year also, the cooperatives would be providing electric service to some 23,000 barangays.

C. EVALUATION PLAN

The rural electrification program in the Philippines has developed an on-going evaluation program in which a variety of studies have already been undertaken. Time and experience have sharpened the descriptive and analytical skills needed to implement the evaluation studies. Originally, the evaluation plan was designed to satisfy a condition precedent of loan 492-T-036. This plan called for a two phase evaluation program; the first phase to be exploratory in nature and the second to be a continuing effort to provide in-depth information

on the impact of the rural electrification project. A good start now has been made on the second phase.

#### 1. Previous Evaluation Elements

During the term of the second rural electrification loan, a plan was proposed and implemented to collect evaluation data in specified areas over two time periods about three years apart. The project was undertaken by the Asian Research Organization (an affiliate of Gallup International). This data collection project, known as the Recoop I and Recoop II studies, surveyed coop and non-coop areas in four provinces and was completed in 1976. This first attempt at evaluation was very productive in terms of findings and experience. Data was collected on income, agricultural production, level of living, and various other demographic, economic and social variables.

In 1976 a case study in the southern Philippines was implemented. This study is known as the MORESCO study and was designed to produce income data about the beneficiaries of rural electrification and to collect exploratory data on a large number of social, economic and demographic variables. The study was undertaken by the Xavier University Institute of Mindanao Culture and was described in the evaluation included in the RE IV loan paper.

In 1976 and 1977 a number of smaller case studies were sponsored by the National Electrification Administration (NEA) in various parts of the country to explore electrification benefits. Various universities have been contacted to design and carry the studies out. These are currently being completed and will provide data on consumer and non-consumer households, businesses, financial institutions and various other key persons and institutions. Preliminary findings are available in summary form for Iloilo and La Union.

Early in 1977 a national sample survey was completed by NEA to measure the impact of electrification on households in coop and non-coop areas, and to compare electrified areas with non-electrified areas. The survey covered a wide range of variables, derived in many cases from experience with the previously-mentioned data collection efforts. The survey was designed by NEA as a national sample of cooperative areas utilizing a control design with non-cooperative areas. It was designed to provide national estimates and comparisons for such variables as salary income, agricultural production, access to electrification, level of service indicators, housing construction, use of appliances, migration, fertility, alternative costs of electricity and other social, economic and demographic data. The questionnaire for this survey was developed by NEA with the assistance of a U.S. Bureau of Census team.

The design of the study, the questionnaire and the analysis were carried out by NEA, while the field work and computer output was done by the Asian Research Organization under contract to NEA. Analysis of these data is presently underway and preliminary information should be available in July.

These studies and surveys constitute a wide range of knowledge of rural electrification. It is felt however, that additional work should be done to more fully understand the wide-ranging benefits of rural electrification.

## 2. The Continuing Evaluation Plan

The plan for evaluation proposed here contemplates a continuation of the basic methodology described above with several important additions. However, even in this methodology a considerable amount of updating, restructuring, redefining and refining will be undertaken. The evaluation plan consists of four basic elements to be carried out by NEA and their survey/analysis contractor.

- a. Basic repetition of the national survey two years after the first survey (in the Spring of 1979) with significant refinements made in full aspects of the study;
- b. Various small-scale studies of special beneficiaries and special case studies similar to the impact studies described in the previous section;
- c. Restructuring and developing existing management and administrative data for evaluation of institutional performance, which is primarily an office and organization project but important to overall evaluation;
- d. Conduct an evaluation of beneficiaries attitudes and perceptions of rural electrification by an on-site, trained observer, possibly a cultural anthropologist or rural sociologist.

A continuation of the national survey would be undertaken to evaluate, in basically socioeconomic terms, the rural electrification project for AID, and would serve as a preliminary basis for determining project feasibility and evaluation for other international lending institutions such as IBRD and the Asian Development Bank. In addition, it will serve as an important management feedback mechanism for project refinement and problem resolution as well as being an important institution-building vehicle for developing within NEA the capability to implement and contract data collection projects required for managerial and administrative information needs.

Case studies and special beneficiaries studies will be completed to provide supplemental information on specific and/or special cases for rural electrification impact as they occur. These impact studies of rural electrification will consider a wide variety of variables including studies of special beneficiaries of rural electrification and the impact it has on them. For example, the benefits which accrue to irrigators and rice millers will be studied in terms of the benefits of agricultural machinery and mechanization and through power use promotion. These special studies will supplement the national survey and verify and expand the information derived from it. The purpose for developing these studies is to better understand and evaluate the impact of rural electrification in these special areas and cases.

Restructuring and further developing important parts of existing managerial and administrative records will provide a concise and accurate picture for the evaluation of institutional performance and process and may show existing gaps in data needs. This is an important component in developing a complete evaluation system. These data will be useful as a management feedback tool in and of themselves and will also be used in conjunction with the national survey and the special studies for supplementary and explanatory information.

Conducting an evaluation of beneficiaries attitudes and perceptions will provide an analysis of the social soundness of rural electrification and can be used to compare and contrast the perceptions and attitudes of beneficiaries with the data from the above-described studies. The use of beneficiaries perceive rural electrification as it relates to them.

### 3. Administrative Linkages

The responsibility for internal evaluation of the Rural Electrification Program rests with the Socio-Economic Evaluation Section in the Directorate for Franchises under the Deputy Administrator for Finance and Franchises. The survey and studies referenced in foregoing section will be conducted with technical assistance provided by special consultants and USAID.

The evaluation section personnel have been supplemented with others from the planning staff in the office of the Administrator to form a working group to evaluate the socioeconomic impact of RE Program. The working group consists of five personnel including two statisticians, two economists and one sociologist. Special training has been provided to equip the evaluation group personnel with technical skills necessary to carry out evaluation requirements and provide NEA with the long-term institutional capabilities for in-depth analysis of RE Operations in the future.

a. Design. Redesign of the continuing national survey, the case studies and special beneficiaries studies will be done under the direction of the survey and analytical group presently assigned to this work in NEA. The design for the restructuring of existing administrative records and data will be assigned within NEA. These three projects will require additional AID financed TDY assistance for implementation. The study of perceptions and attitudes will be contracted with a Philippine institution or individual.

b. Field Work and Analysis. All field work for surveys will be contracted according to specifications developed by the survey and analytical evaluation group in NEA. The analysis of data will be done by the NEA staff with consultants and technical assistance as required.

c. Technical Assistance and Supervision. In order to assure a competent and complete evaluation of the project, USAID will closely monitor the implementation of the evaluation plan as outlined here. The Mission will also provide to NEA with expert technical assistance as the various evaluation projects require. Reports of results will be developed by the NEA and their consulting staff in draft form and reviewed by USAID and its consultants before final copy is prepared.

AID is currently providing PASA services from the U.S. Bureau of the Census to assist NEA in the design, implementation and analysis of these evaluation projects. The PASA experts will continue to assist NEA on evaluation as described here and will provide technical assistance as needed.

D. CONDITIONS, COVENANTS, AND NEGOTIATING STATUS

1. Conditions Precedent to Initial Disbursement of Funds:

a. The standard conditions precedent to disbursement regarding the opinion of the Secretary of Justice and the statement of names of the representatives of the Borrower and NEA and evidence of their authority will be included in the loan agreement.

2. Special Covenants:

a. The Borrower will make available to NEA on a timely basis peso funds required for the implementation of the project.

- b. **The Borrower will absorb any maintenance of value risks on behalf of NEA and the cooperatives.**
- c. **NEA will implement an AID approved evaluation plan (included in the Project paper).**
- d. NEA will incorporate the results and recommendations of an Environmental Assessment (EA) being conducted by the Philippine Inter-Agency Committee of Ecological Studies (ICES) into the project implementation plan.
- e. The Borrower will make the loan proceeds available to NEA on same terms and conditions as the last Rural Electrification Loan (492-T-043) provided by A.I.D. .

DRAFT  
PROJECT DESCRIPTION

A. PROJECT ACTIVITIES

This loan is to provide a \$ 8.4 million line of credit to be used by the National Electrification Administration (NEA) to finance imports of electrical distribution equipment and materials (mostly from the United States, but some from AID Geographic Code 941 countries). These imported materials will be used, together with locally available materials and labor funded by the NEA, to continue implementation of a nation-wide rural electrification program. The individual systems will be owned and operated by Rural Electrification Cooperatives, (patterned after the United States Rural Electrification Cooperatives).

While the long range objective of the Government of the Philippines (GOP) is electrification of the entire country by 1990, program implementation by NEA has concentrated on the attainment of its immediate objectives - the establishment of at least one electric cooperative in every province by the end of 1977 and the completion of a "backbone" system electrically linking all municipalities (equivalent to U.S. counties) in each cooperative area by 1980. The intensity of program momentum has been such that these targets will be met and some may be surpassed. The NEA will have established at least one electric cooperative in every province by 1977 (with the exception of several small island sub-provinces). Even now there are a number of provinces with more than one electric cooperative. By the end of May 1977, 82 electric cooperatives had been organized of which 62 were partially or wholly energized. Furthermore, over 450 municipalities and 4,600 villages have been energized. There are 600,000 households, representing approximately 3½ million people, now receiving electricity through rural electric cooperatives.

The \$8.4 million AID loan will be utilized to finance the procurement and importation into the Philippines of primary electrical conductor materials for the rural electrification program:

a. Conductors \$ 8,400,000 1/

TOTAL \$ 8,400,000 2/

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1/ Approximate quantities needed are: 10,500 km of #2/0 conductor at \$350/km and 17,300 km #1/0 conductor at \$275/km.

2/ These figures are based on the best cost data available at the time of preparation. Adjustments within categories is permitted provided the Total is not exceeded.  
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B. PROJECT IMPLEMENTATION RESPONSIBILITIES

The implementing agency for the overall project will be the National Electrification Administration which was established in 1969 under the provisions of Republic Act No. 6038 and reorganized and expanded in accordance with Presidential Decree No. 269 dated 6 August 1973.

The sub-borrowers of NEA, and individual implementing agencies, will be the various rural electric cooperatives throughout the country. Each of these cooperatives is a non-stock, non-profit, membership cooperative organized for the sole and specific purpose of supplying electric service on an area coverage basis. Most of these electric cooperatives are registered under the provisions of Chapter III of Presidential Decree No. 269, although some are conversions of systems established under earlier acts.

C. END OF PROJECT STATUS

The successful execution of this project will result in construction of over 7,000 kilometers of 13.8 KV primary line "backbone" and the necessary secondary distribution systems needed to bring electric service to approximately 2 million more rural dwellers in CY 78.

Map (showing implementation by year) is available in USAID's office of  
Capital Development and in AID/W's Asia/PD Office.

COMPREHENSIVE FIVE-YEAR DEVELOPMENT PLAN  
BENGUET ELECTRIC COOPERATIVE, INC.

1. This study assumes to cover 13 towns and 1 city with a total of 47,178 consumers served by 1982.
2. Total Physical Plant by 1982 is composed of the following:

Three Phase Line	-	232 Kms.
Single Phase Line	-	402 Kms.
Secondary	-	164 Kms.
Underbuild	-	247 Kms.
<hr/>		
Total	-	1,045 Kms.

Financial Highlights:

1. Total energy sales in 1982 would be about ₱185.2 M on rates averaging at 0.291/KWH in 1978, 0.30/KWH in 1979, 0.321/KWH in 1980 and 0.326/KWH in 1981 - 1982. Gross Cash Margin would be ₱19.3 M.
2. Investment Requirements of ₱58.4 M averages to ₱1,238.00 per consumer. Of this amount, 86% will come from external sources and 14% will be generated by the cooperative.

JCA/jrg  
6-16-77

COOPERATIVE: PENGUET ELECTRIC COOP, INC.									
I. SCHEDULE OF TOWNS TO BE ENERGIZED:									
1973	1974	1975	1977	1978	1979	1980			
1. Trinidad 2. Itogon 3. Tuba	1. Bokod 2. Baguio City	1. Tublay 2. Sablan	1. Kabayan	1. Atok 2. Kapangan 3. Kibungan	1. Bugias 2. Mankayan	1. Bakun			
2. INCREMENTAL CONSUMERS		AS OF	PLANNING YEAR					TOTAL AS	
		1978	1977	1978	1979	1980	1981	1982	of 1982
a. RESIDENTIAL		14273	5304	5719	5162	4058	3983	3040	41539
b. COMMERCIAL		1913	725	781	705	555	545	415	5639
c. INDUSTRIAL (KW)		5343	1335	1669	2503	3754	1877	2065	18543
d. PUBLIC BUILDINGS		69	9	9	10	17	12	1	127
e. STREET LIGHTS (BULBS)		1611	114	90	21	10	10	10	1866
3. ENERGY USE									
a. RESIDENTIAL (KWH/CONN/MO)		110/30	115/32	120/34	125/36	130/38	135/40	140/42	140/42
b. COMMERCIAL (KWH/CONN/MO)		400/50	410/53	420/56	430/59	440/62	450/65	460/68	460/68
c. INDUSTRIAL (TOTAL KWH/MO. X 1000)		2700	3375	4219	5273	5800	6330	7018	7018
d. PUBLIC BUILDINGS (KWH/CONN/MO)		890	895	900	905	910	915	920	920
e. STREET LIGHTS (KWH/BULB/MONTH)		63	63	63	63	63	63	63	63
f. TOTAL SYSTEM (KWH/MONTH X 1000)		5063	5513	5869	6236	6592	6936	7275	7275
4. INCREMENTAL LOAD (KW)									
a. RESIDENTIAL		5138	2016	2250	2116	1745	1792	1429	16466
b. COMMERCIAL		2228	841	953	881	716	719	560	6908
c. INDUSTRIAL		5340	1335	1669	2503	3754	1877	2065	18543
d. PUBLIC BUILDINGS		170	22	23	25	43	30	3	316
e. STREET LIGHTS		242	218	266	280	288	294	300	1888
TOTAL		13128	4432	5141	5805	6546	4712	4357	44121

ITEM	AS OF 1976	1977	PLANNING YEAR					TOTAL AS OF 1982
			1978	1979	1980	1981	1982	
<b>5. PHYSICAL REQUIREMENTS</b>								
a. TRANSMISSION LINE (KMS.)								
b. PRIMARY 3 Ø BACKBONE (KMS.)	123	32	52.5	24				231.5
c. 3 Ø IRRIGATION (KMS.)								
1 Ø LATERAL (KMS)	29.5	10	133	106.6	61	52	10	402
c. SECONDARY (KMS.)	59	17	14	31	18	16	7	164
d. UNDERBUILD (KMS.)	89	20	56	38	18	16	10	247
e. TRANSFORMATION (KVA)	30796	424	3906	3526	2658	2729	2218	46257
f. SERVICE DROP AND METER	16843	5453	6509	5877	4630	4549	3448	47308
g. STREET LIGHT	1611	50	114	97	51	39	39	2001
h. SUBSTATION (KVA)	6.3	25	20					51.3
i. POWER PLANT (KW)								
j. GENERAL PLANT (BLDGS.)			4	3	1	1		9
k. RENOVATIONS								
1. BAGUIO CITY	14	26	10	7				57
2. LA TRINIDAD	7	6						13
3. ITOGON	0.5	1.5						2
4. MANKAYAN			3					3
<b>6. INVESTMENT REQUIREMENTS ('000)</b>								
a. A & E SERVICES	189	52	231	114	49	44	6	685
b. TRANSMISSION LINE								
c. PRIMARY 3 Ø BACKBONE	4068	1117	1838	826				7849
3 Ø IRRIGATION								
1 Ø LATERALS	670	201	2807	2028	1222	1111	155	8194
d. SECONDARY	826	238	196	465	288	272	126	2411
e. UNDERBUILD	267	60	168	133	72	72	50	822
f. TRANSFORMATION	3738	52	516	497	401	442	384	6080
g. SERVICE DROP AND METER	1814	1935	2064	2375	2002	2104	1708	14002
h. STREET LIGHT	549	17	41	38	21	17	17	700
i. SUBSTATION	309	1225	1040					2574
j. POWER PLANT								
k. GENERAL PLANT			3500	1500	500	500		6000
l. RENOVATIONS								
1. BAGUIO CITY	462	858	350	259				1929
2. LA TRINIDAD	231	198						429
3. ITOGON	17	50						67
4. MANKAYAN			99					99
m. ACQUISITION COST	956	4462	120					5538
n. MISCELLANEOUS			150	200	200	120	100	770
o. CONTINGENCIES	45	45	45	60	24	22	3	244
<b>INCREMENTAL PLANT</b>								
<b>INFLATED AT 5% PER ANNUM</b>								
TOTAL INFLATED COSTS	14191	10510	13165	8495	4779	4704	2549	
TOTAL PLANT		24701	37866	46361	51140	55844	58398	58393

7. FINANCIAL PROJECTIONS	AS OF		PLANNING YEAR					TOTAL AS OF
	1976	1977	1978	1979	1980	1981	1982	1982
a. TOTAL REVENUE	40671	20508	20507	22472	25376	27166	28494	185194
b. TOTAL CASH EXPENSES	36720	19224	20245	21279	22244	23157	24026	165895
1. POWER PURCHASED/GENERATED	33267	18166	18893	19835	20718	21542	22332	154753
2. OPERATION AND MAINTENANCE	615	410	437	464	490	516	541	3473
3. GEN. ADM. & CONSUMER ACCOUNT	1838	648	915	980	1036	1099	1153	7669
c. GROSS CASH MARGIN	4951	1284	262	1193	3132	4009	4468	19299
d. LESS : DEPRECIATION	547	1235	1893	2318	2557	2792	2920	14262
e. INTEREST ON LONG-TERM DEBT	818	315	399	1139	1371	1465	1490	6997
f. NET INCOME (NI)	3586	(266)	(2030)	(2264)	796	(248)	58	(1960)
g. NI (AS OF % OF PLANT IN SERVICE)	25	( 1)	( 5)	( 5)	( 2)	(0.4)	0.1	( 3)
h. GROSS CASH MARGIN	4951	1284	262	1193	3132	4009	4468	19299
i. LESS : AMORTIZATION				2149	2149	2149	2149	8596
j. CASH AVAIL. FOR REINVESTMENT (CAR)	4951	1284	262	( 956)	983	1860	2319	10703
k. CAR (AS % OF GROSS REVENUE)	12	6	1	( 4)	4	7	8	6
l. CAR (AS % OF ANNUAL INVESTMENT)	35	5	1	( 2)	2	3	4	18
m. NET PLANT IN USE/CONSUMER (P)	956	1199	1422	1446	1408	1378	1335	1335
<b>8. RATES</b>		1977	1978	1979	1980	1981-82		
AVE. RATE/ KWH SOLD		0.31	0.291	0.30	0.321	0.326		
<b>9. SOURCES &amp; USES OF FUNDS (P'000)</b>								
	1976	1977	1978	1979	1980	1981	1982	
<b>a. SOURCES</b>								
1. FUNDS, BEGINNING	0	4072	3354	4050	3375	2711	2808	
2. LOAN FUND	13312	8508	13599	8776	3132	2941		
3. MEMBERSHIP FEE	63	30	30	29	23	23	17	
4. GROSS CASH MARGIN	4951	1284	262	1193	3132	4009	4468	
TOTAL	18326	13894	17245	14048	9662	9684	7293	
<b>b. USES</b>								
1. AMORTIZATION								
2. CAPITAL EXPENDITURES	14191	10510	13165	8495	4779	4704	2549	
3. OTHERS	63	30	30	29	23	23	17	
TOTAL	14254	10540	13195	10673	6951	6876	4715	
<b>c. NET AVAILABLE (DEFICIT)</b>	4072	3354	4050	3375	2711	2808	2578	

Assumption: i - 3% interest rate, 5 yrs grace, 25 years to pay will be applied on loans.

IQ. PROJECTED BALANCE SHEET (₹'000)	December 31, 1976	December 31, 1982
<b>ASSETS</b>		
a. TOTAL UTILITY PLANT	14191	
b. LESS ACCUMULATED DEPRECIATION	547	58393
c. NET UTILITY PLANT	13644	14262
d. OTHER ASSETS	2290	44131
e. WORKING CAPITAL & CASH REVENUES	4072	
f. TOTAL ASSETS	20006	2578
		46709
<b>LIABILITIES AND EQUITIES</b>		
g. MEMBERSHIP AND OTHER EQUITIES	63	
h. ACCUMULATED NET MARGIN	3586	218
i. LONG-TERM DEBT	13312	(1960)
j. CURRENT LIAB. & OTHER CREDITS	3045	41672
k. TOTAL LIABILITIES & EQUITIES	20006	6779
		46709

II. REMARKS :

COMPREHENSIVE FIVE-YEAR DEVELOPMENT PLAN  
PAMPANGA ELECTRIC COOPERATIVE, INC.

1. This study assumes to cover 21 towns with a total of 116,335 consumers served by 1982.
2. Total Physical Plant by 1982 is composed of the following:

Three Phase Line	-	299 Kms.
Single Phase Line	-	373 Kms.
Secondary	-	144 Kms.
Underbuild	-	495 Kms.
		<hr/>
Total		1,311 Kms.

Financial Highlights:

1. Total energy sales in 1982 would be about ₱264.0 M on rates averaging at 0.37/KWH in 1977, 0.346/KWH in 1978 - 79 and 0.374/KWH in 1980 - 82. Gross Cash Margin would be ₱25 M.
2. Investment Requirements of ₱89.3 M averages to ₱784.00 per consumer. Of this amount, 87% will come from external sources and 13% will be generated by the cooperative.

JCA/jrg  
6-16-77

COOPERATIVE: DAMPANGA ELECTRIC COOP., INC.													
I. SCHEDULE OF TOWNS TO BE ENERGIZED:													
1973		1974		1975		1976		1978		1979		1980	
1. Arayat		1. Apalit		1. Bacolor		1. Magalang		1. Porac		1. Lubao		1. San Fernando	
2. Mexico		2. Macabebe				2. Guagua		2. Sta. Rita		2. Florida Blanca			
3. San Luis		3. Masantol				3. Sexmoan							
4. San Simon		4. Minalin				4. Mabalacat							
5. Sta. Ana		5. Sto. Tomas											
6. Candaba													
2. INCREMENTAL CONSUMERS		AS OF 1976	1977	PLANNING YEAR					TOTAL AS OF 1982				
				1978	1979	1980	1981	1982					
a. RESIDENTIAL		42949	8497	8683	12122	12162	13036	11775	111224				
b. COMMERCIAL		568	110	107	125	1443	141	126	2620				
c. INDUSTRIAL		43	5	22	29	62	10	17	190				
d. IRRIGATION		27	5	11	12	10	11	10	86				
e. STREET LIGHTS		636	292	184	259	371	180	93	2215				
3. ENERGY USE													
a. RESIDENTIAL (KWH/CONN/MO.)		40	47	53	57	68	70	73	73				
b. COMMERCIAL (KWH/CONN/MO.)		533	783	842	899	718	1065	1139	1139				
c. INDUSTRIAL (TOTAL KWH/MO. X 1000)		484	544	752	1140	1925	2656	3051	3051				
d. IRRIGATION (TOTAL KWH/YR. X 1000)		1945	2352	3315	4152	6336	8017	9850	9850				
e. STREET LIGHTS (KWH/CONN/MONTH)		127	158	190	204	230	248	273	273				
f. TOTAL SYSTEM (KWH/MONTH X 1000)		2745	3838	5067	6780	10414	13480	15621	15621				
4. INCREMENTAL LOAD (KW)													
a. RESIDENTIAL		4839	1438	2011	2840	3984	2963	2886	20961				
b. COMMERCIAL		1829	496	635	757	5579	1256	1368	11920				
c. INDUSTRIAL		4052	694	2140	4059	6288	2416	3266	22917				
d. IRRIGATION		1601	480	1114	1159	1363	1285	1676	8678				
e. STREET LIGHTS		237	151	142	119	224	130	75	1078				
TOTAL		12560	3259	6042	8934	17438	8050	9271	66554				

ITEM	AS OF 1976	1977	PLANNING YEAR					TOTAL AS OF 1982
			1978	1979	1980	1981	1982	
<b>5. PHYSICAL REQUIREMENTS</b>								
a. TRANSMISSION LINE (KMS.)								
b. PRIMARY 3 Ø BACKBONE (KMS.)			167.70	37.40	34.35			239.45
c. 3 Ø IRRIGATION (KMS.)			32.50	10.40	8	8.80		59.70
1 Ø LATERAL (KMS.)			128.45	98.22	78.30	53.10	14.70	372.77
c. SECONDARY (KMS.)			60.11	27.55	25.67	28.15	2.94	124.42
d. UNDERBUILD (KMS.)			236.12	109.01	96.20	44.66	9.68	494.81
e. TRANSFORMATION (KVA)		8500	15025	22750	44135	20505	20465	131380
f. SERVICE DROP AND METER		8617	8825	12288	15679	13198	11028	70533
g. STREET LIGHT		170	174	242	283	261	236	1366
h. SUBSTATION (KVA)								
i. POWER PLANT (KW)								
j. GENERAL PLANT (BLDGS.)								
k. RENOVATIONS								
1.								
2.								
3.								
4.								
<b>6. INVESTMENT REQUIREMENTS ('000)</b>								
a. A & E SERVICES	128	108	356	507	799	324	282	2684
b. TRANSMISSION LINE								
c. PRIMARY 3 Ø BACKBONE			3773	899	884			6556
3 Ø IRRIGATION			626	214	176	208		1224
1 Ø LATERALS	5837	1576	1237	1012	863	626	186	11337
d. SECONDARY			836	410	409	480	54	2189
e. UNDERBUILD			758	374	351	175	41	1699
f. TRANSFORMATION	2970	145	2735	4436	9180	4573	4843	28882
g. SERVICE DROP AND METER	1992	893	1011	1503	2087	1859	1758	11103
h. STREET LIGHT	62	85	93	138	173	171	165	887
i. SUBSTATION								
j. POWER PLANT								
k. GENERAL PLANT	3491	471	734	696	771	366	407	6936
l. RENOVATIONS								
1.								
2.								
3.								
4.								
m. ACQUISITION COST	3497		2329	3681	5833			15360
n. MISCELLANEOUS								
o. CONTINGENCIES								
INCREMENTAL PLANT	17977	67	299	283	440	179	158	1426
INFLATED AT 5% PER ANNUM		3345	14967	14153	21986	8961	7894	
TOTAL INFLATED COSTS								
TOTAL PLANT		21322	36289	50442	72428	81389	89283	89283

7. FINANCIAL PROJECTIONS	AS OF	PLANNING YEAR							TOTAL AS OF
	1976	1977	1978	1979	1980	1981	1982	1982	
a. TOTAL REVENUE	20224	17041	21025	28136	46788	60562	70182	263962	
b. TOTAL CASH EXPENSES	17850	15199	20052	23508	41222	54345	63436	238614	
1. POWER PURCHASED/GENERATED	13205	11975	15808	21155	33849	44982	53332	192306	
2. OPERATION AND MAINTENANCE	1454	1106	1447	1928	2937	3782	4329	17005	
3. GEN. ADM. & CONSUMER ACCOUNT	3191	218	2797	3425	4438	5579	5755	27303	
c. GROSS CASH MARGIN	2374	1842	973	1628	5562	6219	6748	25348	
d. LESS : DEPRECIATION	2271	1066	1812	2522	3621	4069	4162	19827	
e. INTEREST ON LONG-TERM DEBT	630	626	703	1141	1552	2139	2209	9005	
f. NET INCOME (NI)	(527)	150	(1549)	(2005)	397	11	75	(3284)	
g. NI (AS OF % OF PLANT IN SERVICE)	(3)	1	(4)	(2)	1	.01	.1	(4)	
h. GROSS CASH MARGIN	2374	1842	973	1628	5562	6219	6748	25348	
i. LESS : AMORTIZATION	-	-	1336	1336	1336	1336	1336	6680	
j. CASH AVAIL. FOR REINVESTMENT (CAR)	2374	1842	(363)	292	4228	4883	5412	18668	
k. CAR (AS % OF GROSS REVENUE)	12	11	(2)	1	9	8	7	7	
l. CAR (AS % OF ANNUAL INVESTMENT)	22	55	(2)	2	30	52	68	21	
m. NET PLANT IN USE/ CONSUMER (P)	361	389	566	655	775	758	745	745	
B. RATES	Existing (1977)		1978-1979		1980 - 1982				
AVE. RATE / KWH SOLD	0.37		0.326		0.372				
9. SOURCES & USES OF FUNDS (₹'000)			PLANNING YEAR						
a. SOURCES	1976	1977	1978	1979	1980	1981	1982		
1. FUNDS, BEGINNING	-	5247	4589	4339	4800	7262	6233		
2. LOAN FUND	20850	845	15080	14322	20220	8049	3095		
3. MEMBERSHIP FEE	199	45	45	64	80	67	60		
4. GROSS CASH MARGIN	2374	1842	973	1628	5562	6219	6748		
TOTAL	23423	7979	20687	20353	30664	16597	16136		
b. USES									
1. AMORTIZATION	-	-	1336	1336	1336	1336	1336		
2. CAPITAL EXPENDITURES	17977	3345	14967	14153	21986	8961	7894		
3. OTHERS	199	45	45	64	80	67	60		
TOTAL	18176	3390	16348	15553	23402	10364	9290		
c. NET AVAILABLE (DEFICIT)	5247	4589	4339	4800	7262	6233	6846		

Assumption A - 3% interest rate on loans, 5 years grace period, 25 years to pay

10. PROJECTED BALANCE SHEET (P'000)	December 31, 1976	December 31, 1982
<b>ASSETS</b>		
a. TOTAL UTILITY PLANT	17977	89283
b. LESS: ACCUMULATED DEPRECIATION	2271	19827
c. NET UTILITY PLANT	15706	69456
d. OTHER ASSETS	10808	
e. WORKING CAPITAL & CASH REVENUES	205	6846
f. TOTAL ASSETS	26719	76302
<b>LIABILITIES AND EQUITIES</b>		
g. MEMBERSHIP AND OTHER EQUITIES	199	566
h. ACCUMULATED NET MARGIN	1097	(5200)
i. LONG-TERM DEBT	23255	70781
j. CURRENT LIAB. & OTHER CREDITS	273	3161
k. TOTAL LIABILITIES & EQUITIES	26719	76302

11. REMARKS :

COMPREHENSIVE FIVE-YEAR DEVELOPMENT PLAN  
LA UNION ELECTRIC COOPERATIVE, INC.

1. This study assumes to electrify 98% of the total service area by 1982. This comprises 21 towns (610 barrios) with a total of 55,000 consumers served.

2. Total physical plant by 1982 is composed of the following :

Three Phase Line	- 7,534 Kms.
Single Phase Line	- 3,873 Kms.
Secondary	- 1,020 Kms.
Underbuild	- 914 Kms.

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Total - 13,341 Kms.

Financial Highlights :

1. Total energy sales in 1982 would be about ₱112.9 M on rates averaging at 0.34/KWH in 1977, to 0.331/KWH in 1978 - 79 to 0.349/KWH in 1980 - 1982. Gross Cash Margin would be ₱16.6 M.

2. Investment Requirements of ₱44.3 M average to ₱827.00 per consumer. Of this amount ₱38.6 M (87%) will come from loan funds (external source) and ₱5.7 M (13%) will be generated by the coop.

JCA/ty'O'  
06-15-77



I T E M	AS OF 1976	1977	P L A N N I N G   Y E A R					TOTAL AS OF 1982
			1978	1979	1980	1981	1982	
<b>5. PHYSICAL REQUIREMENTS</b>								
a. TRANSMISSION LINE (KMS.)								
b. PRIMARY 3 Ø BACKBONE (KMS.)	107	25	15	10	5	5	5	172
c. 3 Ø IRRIGATION (KMS.)	7	10	3	2	2	2	1	27
1 Ø LATERAL (KMS.)	54	27	20	15	15	10	10	151
c. SECONDARY (KMS.)	61	20	18	8	7	5	5	122
d. UNDERBUILD (KMS.)	110	41	20	20	15	10	10	229
e. TRANSFORMATION (KVA)	6610	1000	900	650	500	450	300	10410
f. SERVICE DROP AND METER	507	220	250	296	222	185	148	1828
g. STREET LIGHT	693	120	130	110	100	90	90	1243
h. SUBSTATION (KVA)	5	5						15
i. POWER PLANT (KW)		200	100					300
j. GENERAL PLANT (BLDGS.)	4	1	1	1	1	1	1	10
k. RENOVATIONS								
1. 1 <sup>st</sup> District	1	3	5	3				11
2. 2 <sup>nd</sup> District	6	10	8	5				29
3.								
4.								
<b>6. INVESTMENT REQUIREMENTS ('000)</b>								
a. A & E SERVICES	362	229	110	59	48	22	120	970
b. TRANSMISSION LINE								
c. PRIMARY 3 Ø BACKBONE	4001	825	495	330	165	165	165	6126
3 Ø IRRIGATION	728	330	99	66	66	66	33	1388
1 Ø LATERALS	2050	515	380	285	285	190	190	3873
d. SECONDARY	516	160	142	62	50	40	40	1020
e. UNDERBUILD	438	176	80	80	60	40	40	914
f. TRANSFORMATION	855	129	116	84	68	58	39	1346
g. SERVICE DROP AND METER	178	77	88	104	78	65	52	622
h. STREET LIGHT	271	52	59	50	45	41	41	561
i. SUBSTATION	1042	2000					2000	5042
j. POWER PLANT		1000	500					1500
k. GENERAL PLANT	1575	500	500	500	500	500	500	4575
l. RENOVATIONS								
1. 1 <sup>st</sup> District		24	165	24				213
2. 2 <sup>nd</sup> District	216	80	262	40				600
3.								
4.								
m. ACQUISITION COST	2391	1500	5000					8891
n. MISCELLANEOUS	636	380	400	82	68	60	161	1789
o. CONTINGENCIES		160	168	35	29	25	68	485
INCREMENTAL PLANT	15289	8137	8588	1805	1465	1292	3449	39955
INFLATED AT 5% PER ANNUM		370	1342	406	330	402	1390	4340
TOTAL INFLATED COSTS	15289	8707	9810	2211	1795	1694	4839	4340
TOTAL PLANT		28946	33756	35967	37762	39456	44295	44295

7. FINANCIAL PROJECTIONS	AS OF		PLANNING YEAR					TOTAL AS OF
	1976	1977	1978	1979	1980	1981	1982	1982
a. TOTAL REVENUE	5854	5840	9349	15978	20960	25752	30702	112935
b. TOTAL CASH EXPENSES	4969	4637	8428	13891	17626	20659	25608	96318
1. POWER PURCHASED/GENERATED	3547	3409	6019	9528	12498	15356	18095	68452
2. OPERATION AND MAINTENANCE	223	267	478	769	1022	1358	1500	5517
3. GEN. ADM. & CONSUMER ACCOUNT	1199	961	1931	3094	4106	5045	6013	22349
c. GROSS CASH MARGIN	885	703	921	1587	3334	4093	5094	16617
d. LESS : DEPRECIATION	851	1197	1688	1798	1888	1973	2215	11610
e. INTEREST ON LONG-TERM DEBT	577	460	779	1042	1059	1042	1019	5978
f. NET INCOME (NI)	(523)	(954)	(1546)	(1255)	387	1078	1860	(971)
g. NI (AS OF % OF PLANT IN SERVICE)	(4)	(4)	(5)	(6)	1	3	4	(2)
h. GROSS CASH MARGIN	885	703	921	1587	3334	4093	5094	16617
i. LESS : AMORTIZATION	-	-	-	1470	1470	1470	1470	5880
j. CASH AVAIL. FOR REINVESTMENT (CAR)	885	703	921	117	1864	2623	3624	10737
k. CAR (AS % OF GROSS REVENUE)	15	13	9	1	9	10	11	9
l. CAR (AS % OF ANNUAL INVESTMENT)	6	8	9	5	104	155	75	24
m. NET PLANT IN USE/CONSUMER (P)	982	1114	1031	878	801	760	786	786
<b>8. RATES</b>								
		1977	1978 - 79		1980 - 82			
AVE. RATE / KWH SOLD		0.34	0.331		0.349			
<b>9. SOURCES &amp; USES OF FUNDS (₹'000)</b>								
	1976	1977	1978	1979	1980	1981	1982	
a. SOURCES								
1. FUNDS, BEGINNING	-	1007	1837	2405	1592	1822	2751	
2. LOAN FUND	15361	8534	9457	1281	161	-	1484	
3. MEMBERSHIP FEE	79	30	55	39	29	24	20	
4. GROSS CASH MARGIN	885	703	921	1587	3334	4093	5094	
TOTAL	16325	10674	12270	5312	5116	5939	9349	
b. USES								
1. AMORTIZATION	-	-	-	1470	1470	1470	1470	
2. CAPITAL EXPENDITURES	15339	8707	9810	2211	1795	1694	4839	
3. OTHERS	79	30	55	39	29	24	20	
TOTAL	15318	8737	9865	3720	3294	3188	6329	
c. NET AVAILABLE (DEFICIT)	1007	1837	2405	1592	1822	2751	3020	

Assumption A - Loans will have an interest rate of 3% , 5 yrs. grace , 25 years to pay

IO. PROJECTED BALANCE SHEET (₹'000)	December 31, 1976	December 31, 1982
<b>ASSETS</b>		
a. TOTAL UTILITY PLANT	15239	24295
b. LESS ACCUMULATED DEPRECIATION	851	11610
c. NET UTILITY PLANT	14388	32685
d. OTHER ASSETS	796	
e. WORKING CAPITAL & CASH REVENUES	1007	3020
f. TOTAL ASSETS	16131	35705
<b>LIABILITIES AND EQUITIES</b>		
g. MEMBERSHIP AND OTHER EQUITIES	79	276
h. ACCUMULATED NET MARGIN	(272)	(971)
i. LONG-TERM DEBT	15361	30698
j. CURRENT LIAB. & OTHER CREDITS	963	5702
k. TOTAL LIABILITIES & EQUITIES	16131	35705

II. REMARKS :

SCHEDULE OF CONSTRUCTION  
DISTRIBUTION LINES  
CALENDAR YEAR 1977

PROJECTS	TOTAL KILOMETERS BACKBONE	PROJECTS	TOTAL KILOMETERS BACKBONE
1. ILOCOS NORTE	150	28. CEBU I	95
2. ILOCOS SUR	100	29. BOHOL I	25
3. BENGUET	145	30. NEGROS ORIENTAL I	70
4. ABRA	70	31. NEGROS ORIENTAL II	120
5. CAGAYAN I	130	32. WESTERN SAMAR I	85
6. ISABELA I	90	33. WESTERN SAMAR II	190
7. NUEVA VIZCAYA	30	34. SOUTHERN LEYTE	30
8. IPUGAO	15	35. LEYTE I	50
9. QUIRINO	10	36. LEYTE II	110
10. PAMPANGA	180	37. LEYTE III	105
11. NUEVA ECIJA II	170	38. LEYTE IV	90
12. BATAAN	160	39. ZAMBOANGA NORTE	165
13. DATANGAS I	45	40. ZAMBOANGA SUR I	135
14. RIZAL I	15	41. BASILAN	20
15. QUEZON I	105	42. SULU	30
16. MINDORO ORIENTAL I	30	43. TAWI-TAWI	55
17. MINDORO ORIENTAL II	90	44. LANAOSUR	60
18. PALAWAN	33	45. MISAMIS OCC. I	110
19. MARINDUQUE	65	46. MISAMIS OCC. II	215
20. CATANDUANES	20	47. MISAMIS ORIENTAL II	280
21. CAMARINES SUR III	110	48. AGUSAN NORTE	226
22. CAMARINES SUR IV	75	49. DAVAO NORTE	94
23. SORSOGON I	30	50. MAGUINDANAO	200
24. SORSOGON II	120	51. SOUTH COTABATO I	105
25. Aklan	80	52. SOUTH COTABATO II	100
26. ILOILO II	360	53. SULTAN KUDARAT	95
27. NEGROS OCCIDENTAL II	55	TOTAL	<u>5343 Kilometers (Backbone)</u>

Number of new barrios to be energized	2524
Number of connections in the construction of backbone facilities	131,400
Initial connections in newly energized barrios (laterals)	75,000
Additional connections in areas previously energized	<u>72,500</u>
Total Connections	278,900

SCHEDULE OF CONSTRUCTION  
DISTRIBUTION LINES  
CALENDAR YEAR 1978

P R O J E C T S		TOTAL KILOMETERS BACKBONE	P R O J E C T S		TOTAL KILOMETERS BACKBONE
1.	ILOCOS NORTE	50	31.	NEGROS OCCIDENTAL III	180
2.	ILOCOS SUR	90	32.	CABU I	120
3.	DENQUET	50	33.	CEBU II	110
4.	ABRA	70	34.	CEBU III	37
5.	LA UNION	65	35.	BOHOL I	115
6.	PANGASINAN II	175	36.	BOHOL II	75
7.	PANGASINAN III	180	37.	NEGROS ORIENTAL II	45
8.	BULACAN I	140	38.	WESTERN SAMAR I	35
9.	BULACAN II	100	39.	WESTERN SAMAR II	53
10.	PAMPANGA	120	40.	SOUTHERN LEYTE	50
11.	NUEVA ECIJA I	130	41.	LEYTE V	119
12.	NUEVA ECIJA II	50	42.	ZAMBOANGA NORTE	128
13.	ZAMBALES	60	43.	ZAMBOANGA SUR I	50
14.	TARLAC	115	44.	BASILAN	16
15.	BATANGAS	140	45.	SULU	35
16.	CAVITE	66	46.	BUKIDNON I	140
17.	RIZAL II	86	47.	BUKIDNON II	386
18.	QUEZON III	20	48.	LANAO NORTE	180
19.	MINDORO ORIENTAL	49	49.	LANAO SUR	160
20.	LUBANG	28	50.	SURIGAO SUR I	135
21.	PALAWAN	140	51.	SURIGAO NORTE	186
22.	CAMARINES SUR II	120	52.	MISAMIS OCCIDENTAL I	26
23.	ALBAY	100	53.	AGUSAN NORTE	146
24.	MASBATE	185	54.	AGUSAN SUR	240
25.	AKLAN	80	55.	DAVAO ORIENTAL	205
26.	ANTIQUE	70	56.	MAGUINDANAO	172
27.	CAPIZ	50	57.	NORTH COTABATO	150
28.	ILOILO III	130	58.	SOUTH COTABATO II	300
29.	NEGROS OCCIDENTAL I	105	59.	SULTAN KUDARAT	50
30.	NEGROS OCCIDENTAL II	25	TOTAL <u>6433 Kilometers (Backbone)</u>		

Number of new barrios to be energized	3554
Number of connections in the construction of backbone facilities	157,000
Initial connections in newly energized barrios	106,000
Additional connections in areas previously energized	123,900
<b>Total Connections</b>	<b>386,900</b>

SCHEDULE OF CONSTRUCTION  
DISTRIBUTION LINES  
CALENDAR YEAR 1979

PROJECTS	TOTAL KILOMETERS BACKBONE	PROJECTS	TOTAL KILOMETERS BACKBONE
1. ILOCOS SUR	114	32. ILOILO IV	40
2. BENGUET	45	33. NEGROS OCC. III	41
3. ABRA	75	34. SIQUIJOR	98
4. LA UNION	60	35. BANTAYAN IS.	47
5. MT. PROVINCE	73	36. CEBU II	58
6. PANGASINAN II	200	37. CEBU III	55
7. PANGASINAN III	180	38. CEBU IV	105
8. CAGAYAN II	310	39. BOHOL I	95
9. ISABELA II	450	40. BOHOL II	115
10. NUEVA VIZCAYA	120	41. NEGROS ORIENTAL I	80
11. IFUGAO	40	42. EASTERN SAMAR	290
12. QUIRINO	115	43. NORTHERN SAMAR	150
13. KALINGA-APAYAO	96	44. SOUTHERN LEYTE	77
14. PAMPANGA	150	45. LEYTE V	120
15. NUEVA ECIJA I	120	46. LEYTE VI	70
16. ZAMBALES	70	47. CAMOTES	62
17. TARLAC	80	48. ZAMBOANGA NORTE	149
18. BATANGAS II	46	49. ZAMBOANGA SUR I	155
19. BATANGAS III	100	50. ZAMBOANGA SUR II	145
20. CAVITE	190	51. BASILAN	40
21. FIRST LAGUNA	182	52. SULU	30
22. QUEZÓN I	42	53. OLUTANGA IS.	32
23. QUEZON II	56	54. BUKIDNON I	280
24. ROMBLON	192	55. LANAÓ NORTE	40
25. MINDORO OCCIDENTAL	166	56. SURIGAO SUR II	224
26. PALAWAN	177	57. CAMIGUIN	50
27. CATANDUANES	97	58. AGUSAN SUR	50
28. CAMARINES SUR II	42	59. MAGUINDANAO	20
29. CAMARINES SUR IV	95	60. NORTH COTABATO	260
30. MASBATE	82	61. SAMAL IS.	58
31. ANTIQUE	50	TOTAL <u>6851 Kilometers</u> (Backbone)	

Number of new barrios to be energized	4009
Number of connections in the construction of backbone facilities	160,000
Initial connections in newly energized barrios	110,000
Additional connections in areas previously energized	<u>125,100</u>
Total Connections	395,100

SCHEDULE OF CONSTRUCTION  
DISTRIBUTION LINES  
CALENDAR YEAR 1980

P R O J E C T S		TOTAL KILOMETERS BACKBONE	P R O J E C T S		TOTAL KILOMETERS BACKBONE
1.	ILOCOS SUR	120	21.	CEBU IV	48
2.	MT. PROVINCE	120	22.	BOHOL I	30
3.	CAGAYAN II	160	23.	BOHOL II	120
4.	ISABELA II	50	24.	NEGROS ORIENTAL II	65
5.	ISABELA I	100	25.	EASTERN SAMAR	225
6.	NUEVA VIZCAYA	145	26.	WESTERN SAMAR II	22
7.	IFUGAO	120	27.	NORTHERN SAMAR	210
8.	KALINGA-APAYAO	250	28.	LEYTE VI	38
9.	BATANES IS.	65	29.	PANAON IS.	47
10.	NUEVA ECIJA II	60	30.	ZAMBOANGA NORTE	97
11.	TARLAC	130	31.	ZAMBOANGA SUR II	150
12.	BATANGAS III	75	32.	TAWI-TAWI	15
13.	QUEZON II	96	33.	TUNGKIL IS.	18
14.	QUEZON III	205	34.	DINAGAT IS.	100
15.	QUEZON IV	168	35.	SIARGAO IS.	180
16.	ROMBLON	67	36.	AGUSAN SUR	100
17.	PALAWAN	121	37.	DAVAO ORIENTAL	274
18.	ALBAY	20	38.	DAVAO SUR	75
19.	MASBATE	105	39.	SULTAN KUDARAT	196
20.	NEGROS OCC. III	100	TOTAL <u>4307 Kilometers</u> (Backbone)		

Number of new barrios to be energized	4534
Number of connections in the construction of backbone facilities	115,000
Initial connections in newly energized barrios	135,000
Additional connections in areas previously energized	<u>243,300</u>
<b>Total Connections</b>	<b>493,300</b>

SCHEDULE OF CONSTRUCTION  
DISTRIBUTION LINES  
CALENDAR YEAR 1981

Any backbone distribution line construction will be incidental to new barrio energization.

Number of new barrios to be energized	4521
Initial connections in newly energized barrios	170,000
Additional connections in areas previously energized	<u>396,200</u>
<b>Total Connections</b>	<b>566,200</b>



# HOUSE CONNECTION PROJECTION

(IN HUNDREDS)

COOPS	POTENTIAL HOUSE CONNECTION	AS OF DEC 76	ADDITIONAL HOUSE CONNECTIONS							
			77	78	79	80	81	82	83	84
<b>REGION I</b>										
1. ILOCOS SUR	690	130	54	44	60	62	69	69	69	69
2. ILOCOS NORTE	619	159	87	56	62	62	62	62	62	62
3. LA UNION	728	150	62	34	73	73	73	73	73	73
4. ABRA	249	54	15	19	23	25	25	25	25	25
5. BENGUET	500	171	40	40	48	50	50	50	50	50
6. MT. PROVINCE	156	5			8	16	16	16	16	16
7. PANGASINAN I	323	42	32	32	32	32	32	32	32	32
8. PANGASINAN II	1083	135	24	146	56	108	108	108	108	108
9. PANGASINAN III	1070			354	54	107	107	107	107	107
<b>SUB-TOTAL</b>	<b>5418</b>	<b>846</b>	<b>314</b>	<b>725</b>	<b>416</b>	<b>535</b>	<b>535</b>	<b>535</b>	<b>535</b>	<b>535</b>
<b>REGION II</b>										
1. CAGAYAN I	532	28		9	53	53	53	53	53	53
2. CAGAYAN II	532			13		31	73	73	73	73
3. ISABELA I	692	43	51	59	59	59	69	69	69	69
4. ISABELA II	555			41		56	56	56	56	56
5. NUEVA VIZCAYA	341		27	10	10	22	34	34	34	34
6. IFUGAO	161			2	2	7	16	16	16	16
7. QUIRINO	110			2	2	2	11	11	11	11
8. BATANES	20			1	1	1	2	2	2	2
9. K. APAYAO I	167			6	12	12	17	17	17	17
10. K. APAYAO II	84						8	8	8	8
<b>SUB-TOTAL</b>	<b>3194</b>	<b>71</b>	<b>78</b>	<b>143</b>	<b>139</b>	<b>242</b>	<b>339</b>	<b>339</b>	<b>339</b>	<b>339</b>
<b>REGION III</b>										
1. BULACAN I	693	305	124	32	69	69	69	69	69	69
2. BULACAN II	207		42		21	21	21	21	21	21
3. PAMPANGA	1632	456		150	94	137	163	163	163	163
4. NUEVA ECIJA I	895	216	109	45	45	45	89	89	89	89
5. NUEVA ECIJA II	597	100	5	33	46	46	60	60	60	60
6. BATAAN	436	247	1	44	44	44	44	44	44	44
7. ZAMBALES	686	157	25	120	39	39	69	69	69	69
8. TARLAC	1133	97	106	104	39	45	113	113	113	113
<b>SUB-TOTAL</b>	<b>6279</b>	<b>1578</b>	<b>412</b>	<b>528</b>	<b>397</b>	<b>446</b>	<b>628</b>	<b>628</b>	<b>628</b>	<b>628</b>

# HOUSE CONNECTION PROJECTION

(IN HUNDREDS)

ANNEX B-4

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COOPS	POTENTIAL HOUSE CONNECTION	AS OF DEC 76	ADDITIONAL HOUSE CONNECTIONS							
			77	78	79	80	81	82	83	84
<b>REGION IV</b>										
1. BATANGAS I	526	129	44	53	53	53	53	53	53	53
2. BATANGAS II	677		195	68	68	68	68	68	68	68
3. BATANGAS III	457			203	46	46	46	46	46	46
4. CAVITE	1036	253	26	26	45	104	104	104	104	104
5. LACUNA I	206	137	21	21	21	21	21	21	21	21
6. LAGUNA II	520			201	52	52	52	52	52	52
7. MARINDUQUE	271	15	13	27	27	27	27	27	27	27
8. IJBANG IS.	35				4	4	4	4	4	4
9. MINDORO OR. I	277	46	26	28	28	28	28	28	28	28
10. MINDORO OR. II	366		60	27	37	37	37	37	37	37
11. MINDORO OCC. I	271	11	15	15	15	27	27	27	27	27
12. PALAWAN	501	16		8	22	29	50	50	50	50
13. RIZAL I	140	37	14	14	14	14	14	14	14	14
14. RIZAL II	175		75		15	15	15	15	15	15
15. QUEZON I	854	37	57	68	80	85	85	85	85	85
16. QUEZON II	152					8	15	15	15	15
17. QUEZON III	651				23		65	65	65	65
18. QUEZON IV	145						14	14	14	14
19. ROMBLON	272					20	20	27	27	27
<b>SUB-TOTAL</b>	<b>7532</b>	<b>681</b>	<b>546</b>	<b>759</b>	<b>564</b>	<b>638</b>	<b>745</b>	<b>752</b>	<b>752</b>	<b>752</b>
<b>REGION V</b>										
1. ALBAY	1217	122	83	83	118	118	122	122	122	122
2. MASBATE	884				31	54	88	88	88	88
3. CAMARINES N.	479	59	48	48	48	48	48	48	48	48
4. CAMARINES S. I	394	32	39	39	39	39	39	39	39	39
5. CAMARINES S. II	525		96		34	53	53	53	53	53
6. CAMARINES S. III	399		47		40	40	40	40	40	40
7. CAMARINES S. IV	351		60	25	25	35	35	35	35	35
8. CATANDUANES	287	37	17	18	29	29	29	29	29	29
9. SORSOGON I	326	14	26	33	33	33	33	33	33	33
10. SORSOGON II	419		42	42	42	42	42	42	42	42
<b>SUB-TOTAL</b>	<b>5281</b>	<b>264</b>	<b>456</b>	<b>288</b>	<b>439</b>	<b>491</b>	<b>529</b>	<b>529</b>	<b>529</b>	<b>529</b>

**HOUSE CONNECTION PROJECTION**  
(IN HUNDREDS)

ANNEX B-4  
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COOPS	POTENTIAL HOUSE CONNECTION	AS OF OLC '76	ADDITIONAL HOUSE CONNECTIONS							
			77	78	79	80	81	82	83	84
<b>REGION VI</b>										
1. ABLAN	523	42	30	45	52	52	52	52	52	52
2. ANTIQUE	451		27	27	37	37	45	45	45	45
3. CAPIZ	705	88	48	54	70	70	70	70	70	70
4. ILOILO I	996	50	100	100	100	100	100	100	100	100
5. ILOILO II	745			75	75	75	75	75	75	75
6. ILOILO III	295				29	29	29	29	29	29
7. ILOILO IV	141					14	14	14	14	14
9. NEGROS OCC. I	935	150	52	52	93	93	93	93	93	93
9. NEGROS OCC. II	843	23	6	47	84	84	84	84	84	84
10. NEGROS OCC. III	1128				54	86	113	113	113	113
<b>SUB-TOTAL</b>	<b>6762</b>	<b>362</b>	<b>263</b>	<b>400</b>	<b>594</b>	<b>640</b>	<b>675</b>	<b>675</b>	<b>675</b>	<b>675</b>
<b>REGION VII</b>										
1. NEGROS OR. I	582		18	31	31	58	58	58	58	58
2. NEGROS OR. II	647			32	43	43	65	65	65	65
3. BOHOL I	672	33	47	36	51	60	67	67	67	67
4. BOHOL II	574		1		15	42	57	57	57	57
5. CEBU I	576	6	21	39	58	58	58	58	58	58
6. CEBU II	437		11		21	44	44	44	44	44
7. CEBU III	299		10		7	30	30	30	30	30
8. CEBU IV	499			4		29	50	50	50	50
9. BANTAYAN IS.	130					13	13	13	13	13
10. SIKULJOR	114					11	11	11	11	11
<b>SUB-TOTAL</b>	<b>4530</b>	<b>39</b>	<b>108</b>	<b>142</b>	<b>226</b>	<b>386</b>	<b>453</b>	<b>453</b>	<b>453</b>	<b>453</b>
<b>REGION VIII</b>										
1. LEYTE I	438	73	39	44	44	44	44	44	44	44
2. LEYTE II	201	87	3	20	20	20	20	20	20	20
3. LEYTE III	295	5	3	29	29	29	29	29	29	29
4. LEYTE IV	563			56	56	56	56	56	56	56
5. LEYTE V	589				33	59	59	59	59	59
6. LEYTE VI	160					11	16	16	16	16
7. SO. LEYTE	448	18	18	25	30	39	45	45	45	45
8. W. SAMAR I	292	11		28	29	29	29	29	29	29
9. W. SAMAR II	456	23		30	38	46	46	46	46	46
10. E. SAMAR	477			7		26	48	48	48	48
11. N. SAMAR	583					28	58	58	58	58
11. CAMOTES	105					4	6	8	11	11
<b>SUB-TOTAL</b>	<b>4607</b>	<b>217</b>	<b>63</b>	<b>239</b>	<b>279</b>	<b>391</b>	<b>456</b>	<b>458</b>	<b>461</b>	<b>461</b>

## HOUSE CONNECTION PROJECTION

ANNEX B-4

(IN HUNDREDS)

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COOPS	POTENTIAL HOUSE CONNECTION	AS OF DEC 76	ADDITIONAL HOUSE CONNECTIONS							
			77	78	79	80	81	82	83	84
REGION IX										
1. ZAMBO NORTE I	719			41	56	72	72	72	72	72
2. ZAMBO SUR I	745	2		42	55	74	74	74	74	74
3. ZAMBO SUR II	570				2	29	57	57	57	57
4. ZAMLOANCA CITY	437	121	44	44	44	44	44	44	44	44
5. SULU	538	10	11	22	32	43	54	54	54	54
6. CACAYAN DE SULU	26	1	1	2	3	3	3	3	3	3
7. TAWI-TAWI	63	2	5	5	6	6	6	6	6	6
SUB-TOTAL	3098	136	61	156	198	271	310	310	310	310
REGION X										
1. LANA O NORTE	417	56	13	21	29	42	42	42	42	42
2. LANA O SUR	889	72	27	44	62	89	89	89	89	89
3. MISAMIS OCC. I	242		22	21	24	24	24	24	24	24
4. MISAMIS OCC. II	350			35	35	35	35	35	35	35
5. MORESCO	208	87	21	21	21	21	21	21	21	21
6. MISAMIS OR. II	448		11	45	45	45	45	45	45	45
7. SURIGAO N.	458			1	23	32	46	46	46	46
8. SURIGAO S. I	268	64	13	27	27	27	27	27	27	27
9. SURIGAO S. II	255					26	26	26	26	26
10. AGUSAN DEL N.	497			43	50	50	50	50	50	50
11. AGUSAN DEL S.	358				24	28	36	36	36	36
12. BUKIDNON I	501				10	25	35	50	50	50
13. BUKIDNON II	335				10	17	23	34	34	34
14. CAMIGUIN IS.	87					8	8	8	8	8
SUB-TOTAL	5313	279	107	258	360	469	507	533	533	533
REGION XI										
1. BASILAN	253	27	14	18	20	25	25	25	25	25
2. DAVAO DEL N.	758	33	36	61	76	76	76	76	76	76
3. DAVAO OR.	501				32	32	50	50	50	50
4. DAVAO DEL S.	746	24	29	58	58	58	75	57	75	75
5. MAGUINDANAO	1012	13	20	40	50	65	80	95	101	101
6. SULTAN KUDARAT	456			15	24	34	48	48	48	48
7. N. COTABATO	515				24	52	52	52	52	52
8. S. COTABATO I	405		12	19	26	38	38	38	38	38
9. S. COTABATO II	410		13	20	29	41	41	41	41	41
SUB-TOTAL	5056	97	124	231	339	421	485	500	506	506
		135*								
GRAND TOTAL	57070	4705	2789	3869	3951	4933	5662	5712	5721	5721

\* OTHERS

SCHEDULE OF CONSTRUCTION  
DISTRIBUTION LINES  
CY 77

<u>COOP</u>	<u>NUMBER OF TOWNS</u>	<u>KM. OF LINES</u>
1. Ilocos Norte	7	150
2. Ilocos Sur	5	100
3. Benguet	7	145
4. Abra	5	70
5. Cagayan I	4	130
6. Isabela I	4	90
7. Nueva Vizcaya	2	30
8. Ifugao	1	15
9. Quirino	1	10
10. Pampanga	12	180
11. Nueva Ecija II	6	170
12. Bataan	11	160
13. Batangas I	3	45
14. Rizal	1	15
15. Quezon I	8	105
16. Mindoro Oriental I	1	30
17. Mindoro Oriental II	6	90
18. Palawan	1	33
19. Marikiguague	3	65
20. Catanduanes	1	20
21. Camarines Sur III	6	110
22. Camarines Sur IV	6	75
23. Sorsogon I	2	30
24. Sorsogon II	8	120
25. Aklan	5	80
26. Iloilo II	18	360
27. Negros Occ. II (CENECO)	3	55
28. Cebu I	5	95
29. Bohol I	2	25
30. Negros Oriental I	2	70
31. Negros Oriental II	8	120
32. Western Samar I	4	85
33. W. Samar II	11	190
34. Southern Leyte	2	30
35. Leyte I	2	50
36. Leyte II	2	110
37. Leyte III	7	105
38. Leyte IV	6	90
39. Zamboanga Norte	11	165
40. Zamboanga Sur I	9	135
41. Basilan	1	20
42. Sulu	2	30
43. Tawi-Tawi	4	55
44. Lanao Sur	4	60
45. Misamis Occidental I	7	110
46. Misamis Occidental II	8	215
47. Misamis Oriental II	15	280
48. Agusan Norte	7	226
49. Davao Norte	6	94
50. Maguindanao	10	200
51. So. Cotabato I	7	105
52. Southern Cotabato II	2	100
53. Sultan Kudarat	6	95
<b>TOTAL</b>	<b><u>287</u></b>	<b><u>5,343</u></b>

SCHEDULE OF CONSTRUCTION  
DISTRIBUTION LINES  
CY 78

<u>COOP</u>	<u>NUMBER OF TOWNS</u>	<u>KM. OF LINES</u>
1. Ilocos Norte	2	50
2. Ilocos Sur	6	90
3. Benguet	3	50
4. Abra	5	70
5. La Union	3	65
6. Pangasinan II	9	175
7. Pangasinan III	10	180
8. Bulacan I	5	140
9. Bulacan II	4	100
10. Pampanga	4	120
11. Nueva Ecija I	5	130
12. Nueva Ecija II	2	50
13. Zambales	4	60
14. Tarlac	8	115
15. Batangas	10	140
16. Cavite	5	66
17. Rizal II	6	86
18. Quezon IIV	1	20
19. Mindoro Oriental	3	49
20. Lubang	2	28
21. Palawan	4	140
22. Camarines Sur II	7	120
23. Albay	5	100
24. Masbate	7	185
25. Aklan	4	80
26. Antique	4	70
27. CapiZ	3	50
28. Iloilo III	10	130
29. Negros Occ. I (VRESCO)	4	105
30. Negros Occ. II (CENECO)	1	25
31. Negros Occ. III	10	180
32. Cebu I	6	120
33. Cebu II	6	110
34. Cebu III	2	37
35. Bohol I	7	115
36. Bohol II	5	75
37. Negros Oriental II	3	45
38. W. Samar I	2	35
39. W. Samar II	2	53
40. So. Leyte	2	50
41. Leyte V	6	119
42. Zamboanga Norte	3	128
43. Zamboanga Sur I	3	50
44. Basilan	1	16
45. Sulu	2	35
46. Bukidnon I	3	140
47. Bukidnon II	9	386
48. Lanao Norte	6	180
49. Lanao Sur	6	160
50. Surigao Sur I	4	135
51. Surigao Norte	12	186
52. Misamis Occ. I	1	26
53. Agusan Norte	4	146
54. Agusan Sur	7	240
55. Davao Oriental	5	205
56. Maguindanao	3	172
57. North Cotabato	4	150
58. So. Cotabato II	6	300
59. Sultan Kudarat	2	50
<b>TOTAL</b>	<b>278</b>	<b>6433</b>

SCHEDULE OF CONSTRUCTION  
DISTRIBUTION LINES  
CY 79

	<u>COOP</u>	<u>NO. OF TOWNS</u>	<u>KM. OF LINES</u>
1.	Ilocos Sur	4	114
2.	Benguet	1	45
3.	Abra	5	75
4.	La Union	3	60
5.	Mt. Province	4	73
6.	Pangasinan II	11	200
7.	Pangasinan III	8	180
8.	Cagayan II	9	310
9.	Isabela II	15	450
10.	Nueva Vizcaya	6	120
11.	Ifugao	2	40
12.	Quirino	4	115
13.	Kalinga-Apayao	4	96
14.	Pampanga	5	150
15.	Nueva Ecija I	4	120
16.	Zambales	4	70
17.	Tarlac	4	80
18.	Batangas II	2	46
19.	Batangas III	5	100
20.	Cavite	12	190
21.	First Laguna	13	182
22.	Quezon I	3	42
23.	Quezon II	3	56
24.	Romblon	10	192
25.	Mindoro Occ.	5	166
26.	Palawan	6	177
27.	Catanduanes	5	97
28.	Camarines Sur II	4	42
29.	Camarines Sur IV	3	95
30.	Masbate	5	82
31.	Antique	3	50
32.	Iloilo IV	3	40
33.	Negros Occ. III	3	41
34.	Siquijor	6	98
35.	Bantayan Island	3	47
36.	Cebu II	4	58
37.	Cebu III	3	55
38.	Cebu IV	5	105
39.	Bohol I	6	95
40.	Bohol II	7	115
41.	Negros Oriental I	4	80
42.	Eastern Samar	13	290
43.	Northern Samar	9	150
44.	Southern Leyte	5	77
45.	Leyte V	6	120
46.	Leyte VI	5	70
47.	Camotes	4	62
48.	Zamboanga Norte	3	149
49.	Zamboanga Sur I	5	155
50.	Zamboanga Sur II	5	145
51.	Basilan	2	40
52.	Sulu	2	30
53.	Olutanga Island	2	32
54.	Bukidnon I	9	280
55.	Lanao Norte	2	40
56.	Surigao Sur II	12	224
57.	Camiguin	5	50
58.	Agusan Sur	2	50
59.	Maguindanao	1	20
60.	North Cotabato	5	260
61.	Samal Island	3	58
	<b>TOTAL</b>	<b>206</b>	<b>6,851</b>

SCHEDULE OF CONSTRUCTION  
DISTRIBUTION LINES  
CY 80

<u>COOP</u>	<u>NO. OF TOWNS</u>	<u>KM. OF LINES</u>
1. Ilocos Sur	4	1200
2. Mt. Province	6	120
3. Cagayan II	7	160
4. Isabela II	2	50
5. Isabela I	4	100
6. Nueva Viscaya	5	145
7. Ifugao	3	120
8. Kalinga-Apayao	11	250
9. Batanes Island	6	65
10. Nueva Ecija II	2	60
11. Tarlac	5	130
12. Batangas III	3	75
13. Quezon II	5	96
14. Quezon III	11	205
15. Quezon IV	7	168
16. Romblon	5	87
17. Palawan	6	121
18. Albay	1	20
19. Masbate	7	105
20. Negros Occ. III	4	100
21. Cebu IV	4	48
22. Bohol I	2	30
23. Bohol II	7	120
24. Negros Oriental II	3	65
25. Eastern Samar	10	225
26. Western Samar II	2	22
27. Northern Samar	13	210
28. Leyte VI	2	38
29. Panaon Island	3	47
30. Zamboanga Norte	3	97
31. Zamboanga Sur II	5	150
32. Tawi-tawi	1	15
33. Tungkil Island	1	18
34. Dinagat Island	5	100
35. Siargao Island	8	180
36. Agusan Sur	4	100
37. Davao Oriental	6	274
38. Davao Sur	2	75
39. Sultan Kudarat	4	196
<b>TOTAL</b>	<b><u>189</u></b>	<b><u>4,307</u></b>



# BARRIO PROJECTION

COOPS	POTENTIAL No. OF BARRIOS	AS OF DEC 76	ADDITIONAL BARRIOS							
			77	78	79	80	81	82	83	84
<b>REGION I</b>										
1. ILOCOS NORTE	574	232	85	85	85	87				
2. ILOCOS SUR	781	200	83	83	83	83	83	83	83	
3. BENGUET	242	110	18	19	19	19	19	19	19	
4. ABRA	309	89	27	27	27	27	28	28	28	28
5. LA UNION	605	317	72	72	72	72				
6. MT. PROVINCE	143	1	17	17	18	18	18	18	18	18
7. PANGASINAN I	204	76	21	21	21	21	22	22		
8. PANG. II	553	128	60	60	61	61	61	61	61	
9. PANG. III	461	-	-	65	66	66	66	66	66	66
<b>TOTAL</b>	<b>3872</b>	<b>1153</b>	<b>383</b>	<b>449</b>	<b>452</b>	<b>454</b>	<b>297</b>	<b>297</b>	<b>275</b>	<b>112</b>
<b>REGION II</b>										
1. CAGAYAN I	361	50	51	52	52	52	52	52		
2. CAGAYAN II	397	-	-	-	16	41	66	66	141	67
3. ISABELA I	555	93	77	77	77	77	77	77		
4. ISABELA II	373	-	-	-	12	37	62	62	137	63
5. N. VIZCAYA	148	-	18	18	18	18	19	19	19	19
6. IFUGAO	132	-	16	16	16	16	17	17	17	17
7. QUIRINO	84	-	-	10	12	12	12	12	13	13
8. KAL-APAYAO I	148	-	-	21	21	21	21	21	21	22
9. KA-APAY. II	87	-	-	-	-	-	21	22	22	22
10. BATANES	28	-	-	-	-	-	7	7	7	7
<b>TOTAL</b>	<b>2313</b>	<b>143</b>	<b>162</b>	<b>194</b>	<b>224</b>	<b>274</b>	<b>354</b>	<b>355</b>	<b>377</b>	<b>230</b>

# BARRIO PROJECTION

COOPS	POTENTIAL No. OF BARRIOS	AS OF DEC 76	ADDITIONAL BARRIOS							
			77	78	79	80	81	82	83	84
<b>REGION III</b>										
1. BULACAN I	261	123	34	34	35	35				
2. BULACAN II	56	-	-	18	19	19				
3. PAMPANGA	524	188	84	84	84	84				
4. NUEVA ECIJA I	282	99	45	46	46	46				
5. N. ECIJA II	428	26	67	67	67	67	67	67		
6. ZAMBALES	230	125	26	26	26	27				
7. TARLAC	551	88	77	77	77	77	77	78		
8. BATAAN	311	269	14	14	14					
<b>TOTAL</b>	<b>2643</b>	<b>918</b>	<b>347</b>	<b>366</b>	<b>368</b>	<b>355</b>	<b>144</b>	<b>145</b>		
<b>REGION IV</b>										
1. BATANGAS I	314	73	48	48	48	48	49			
2. BATANGAS II	366	-	-	73	73	73	73	74		
3. BATANGAS III	202	-	-	-	-	30	50	51	71	
4. LAGUNA I	324	47	46	46	46	46	46	47		
5. LAGUNA II	262	-	-	43	43	44	44	44	44	
6. CAVITE	358	83	39	39	39	39	39	40	40	
7. RIZAL I	40	37	3							
8. RIZAL II	71	-	-	35	36					
9. QUEZON I	660	24	90	91	91	91	91	91	91	
10. QUEZON II	108	-	-	-	-	27	27	27	27	
11. QUEZON III	265	-	-	-	33	58	58	58	58	
12. QUEZON IV	121	-	-	-	-	-	30	30	30	31
13. ROMBLON	179	-	-	-	-	25	36	36	46	36
14. MINDORO OR. I	187	60	21	21	21	21	21	22		
15. MIN. OR. II	183	-	-	26	26	26	26	26	26	27
16. MINDORO OCC.	116	4	14	14	14	14	14	14	14	14
17. LUBANG	17	-	-	-	5	6	6			
18. PALAWAN	328	7	40	40	40	40	40	40	40	41
19. MARINDUQUE	198	24	29	29	29	29	29	29		
<b>TOTAL</b>	<b>4299</b>	<b>359</b>	<b>330</b>	<b>505</b>	<b>544</b>	<b>617</b>	<b>679</b>	<b>629</b>	<b>487</b>	<b>149</b>

# BARRIO PROJECTION

MUNICIPALITIES	POTENTIAL No. OF BARRIOS	AS OF DEC 76	ADDITIONAL BARRIOS							
			77	78	79	80	81	82	83	84
<b>REGION V</b>										
1. CAM. NORTE	254	3	42	42	42	42	42	42		
2. CAM. SUR I	275	74	33	33	33	34	34	34		
3. CAM. SUR II	278	-	-	55	55	56	56	56		
4. CAM. SUR III	205	-	-	41	41	41	41	41		
5. CAM. SUR IV	240	-	-	34	34	34	34	34	35	35
6. SORSOGON I	243	9	39	39	39	39	39	39		
7. SORSOGON II	281	-	-	56	56	56	56	57		
8. ALBAY	651	132	86	86	86	87	87	87		
9. MASBATE	503	-	-	-	83	84	84	84	84	84
10. CATANDUANES	251	41	26	26	26	26	26	26	27	27
<b>TOTAL</b>	<b>3181</b>	<b>259</b>	<b>225</b>	<b>412</b>	<b>495</b>	<b>499</b>	<b>499</b>	<b>500</b>	<b>146</b>	<b>146</b>
<b>REGION VI</b>										
1. AKLAN	388	37	50	50	50	50	50	50	51	
2. ANTIQUE	542	-	67	67	68	68	68	68	68	68
3. CAPIZ	472	92	54	54	54	54	54	55	55	
4. ILOILO I	731	92	91	91	91	91	91	92	92	
5. ILOILO II	660	-	-	94	94	94	94	94	95	95
6. ILOILO III	280	-	-	-	21	36	47	47	82	47
7. ILOILO IV	97	-	-	-	-	19	19	19	20	20
8. NEG. OCC. I (VRESCO)	150	43	17	18	18	18	18	18		
9. NEG. OCC. II (CENECO)	87	4	13	14	14	14	14	14		
10. NEGROS OCC. III	244	-	-	-	23	39	49	49	84	
<b>TOTAL</b>	<b>3651</b>	<b>268</b>	<b>292</b>	<b>388</b>	<b>433</b>	<b>483</b>	<b>504</b>	<b>506</b>	<b>547</b>	<b>230</b>

# BARRIO PROJECTION

COOPS	POTENTIAL No. OF BARRIOS	AS OF DEC 76	ADDITIONAL BARRIOS							
			77	78	79	80	81	82	83	84
<b>REGION VII</b>										
1. SQUIJOR IS.	115	-	-	-	-	23	23	23	23	23
2. CEBU I	339	16	46	46	46	46	46	46	47	23
3. CEBU II	223	-	-	-	22	37	37	37	52	38
4. CEBU III	134	-	-	-	17	22	22	22	28	23
5. CEBU IV	194	-	-	-	18	39	39	39	59	
6. BOHOL I	629	82	68	68	68	68	68	69	69	69
7. BOHOL II	506	-	-	-	24	84	84	84	145	85
8. NEGROS OR. I	271	-	38	38	39	39	39	39	39	
9. NEG. OR. II	233	-	-	33	33	33	33	33	34	34
10. BANTAYAN IS.	34	-	-	-	-	6	7	7	7	7
<b>TOTAL</b>	<b>2678</b>	<b>98</b>	<b>152</b>	<b>185</b>	<b>267</b>	<b>397</b>	<b>398</b>	<b>399</b>	<b>503</b>	<b>279</b>
<b>REGION VIII</b>										
1. E. SAMAR	396	-	-	-	-	29	79	79	129	80
2. W. SAMAR I	359	4	44	44	44	44	44	45	45	45
3. W. SAMAR II	313	5	-	44	44	44	44	45	45	45
4. N. SAMAR	432	-	-	-	-	36	86	86	137	87
5. S. LEYTE	427	46	47	47	47	48	48	48	48	48
6. LEYTE I	452	79	62	62	62	62	62	63		
7. LEYTE II	70	15	13	14	14	14				
8. LEYTE III	240	-	34	34	34	34	34	35	35	
9. LEYTE IV	198	-	-	33	33	33	33	33	33	
10. LEYTE V	333	-	-	-	55	55	55	56	56	56
11. LEYTE VI	109	-	-	-	-	21	22	22	22	22
12. CAMOTES	35	-	-	-	-	7	7	7	7	7
<b>TOTAL</b>	<b>3367</b>	<b>149</b>	<b>200</b>	<b>278</b>	<b>333</b>	<b>427</b>	<b>514</b>	<b>519</b>	<b>557</b>	<b>390</b>

# BARRIO PROJECTION

COOPS	POTENTIAL No. OF BARRIOS	AS OF DEC 76	ADDITIONAL BARRIOS							
			77	78	79	80	81	82	83	84
<b>REGION IX</b>										
1. ZAMBO. NORTE	396	-	-	56	56	56	57	57	57	57
2. ZAMBO. SUR I	556	3	-	79	79	79	79	79	79	79
3. ZAMBO. SUR II	296	-	-	-	-	34	59	59	84	60
4. ZAMBO. CITY	86	25	10	10	10	10	10	11		
5. SULU	405	13	-	-	-	53	78	78	100	79
6. CAG. DE SULU	10	3	7	-	-	-	-	-	-	-
7. TAWI-TAWI	30	5	3	3	3	3	3	3	3	4
<b>TOTAL</b>	<b>1779</b>	<b>49</b>	<b>20</b>	<b>148</b>	<b>148</b>	<b>235</b>	<b>286</b>	<b>287</b>	<b>327</b>	<b>279</b>
<b>REGION X</b>										
1. BUKIDNON I	279	-	-	-	46	46	46	47	47	47
2. BUKIDNON II	164	-	-	-	27	27	27	27	28	28
3. LANA O NORTE	434	79	50	50	51	51	51	51	51	
4. LANA O SUR	1356	356	125	125	125	125	125	125	125	125
5. SURIGAO NO.	368	-	46	46	46	46	46	46	46	46
6. SUR. SUR I	141	13	18	18	18	18	18	19	18	
7. SUR. SUR II	178	-	-	-	-	15	35	36	56	36
8. CAMIGUIN	62	-	-	-	-	7	12	12	18	13
9. MIS. OCC. I	222	-	-	37	37	37	37	37	37	
10. MIS. OCC. II	233	-	-	38	39	39	39	39	39	
11. MIS. OR. I	185	144	20	21	-	-	-	-	-	-
12. MIS. OR. II	261	-	-	43	43	43	44	44	44	
13. AGUSAN NORTE	182	-	-	30	30	30	30	31	31	
14. AGUSAN SUR	186	-	-	-	31	31	31	31	31	31
<b>TOTAL</b>	<b>4251</b>	<b>592</b>	<b>259</b>	<b>408</b>	<b>493</b>	<b>515</b>	<b>541</b>	<b>545</b>	<b>572</b>	<b>326</b>



CONSTRUCTION OF TRANSMISSION LINES  
1977

LUZON

<u>From</u>	<u>To</u>	<u>Km. of Lines</u>
Pantabangan	Muñoz	35
Bongabon	Cabanatuan	35
Cabanatuan	Gapan	20
Siniloan	Kalayaan	12
Kalayaan	Pila	20
Sampaloc	Atimonan	35
Atimonan	Lucena City	30
Atimonan	Gumaca	35
Gumaca	Pitogo	12
Gumaca	Tagkawayan	48
Capalonga	Labo	40
Labo	Paracale	16
Labo	Daet	20
Sipocot	Naga City	32
Naga City	Libmanan	25
Naga City	Tinambac	35
Naga City	Lagonoy	38
Naga City	Iriga City	30
Iriga City	Balatan	15
Iriga City	Polangui	48
Polangui	Pantao	22
Polangui	Legaspi City	31
Legaspi	Sorsogon	44
Sorsogon	Irosin	20
Irosin	Bulan	14
Sub-Total		712

VISAYAS

Calapan	Pinamalayan	45
Nabas	Kalibo	35
Kalibo	Panitan	55
Panitan	Pototan	60
Pototan	Sta. Barbara	20
Sta. Barbara	Tigbauan	25
Tigbauan	San Joaquin	35
San Joaquin	Sibalom	20
Capiz City	Victoria	28
Victoria	Talisay	30
Talisay	Bago City	30
Bago City	Ponte-verda	20
Bindoy	Manjuyod	10
Manjuyod	Amlan	27

CONSTRUCTION OF TRANSMISSION LINES  
1977

VISAYAS

<u>From</u>	<u>To</u>	<u>Km. of Lines</u>
Amlan	Dumaguete City	14
Bogo	Sogod	32
Sogod	Danao City	28
Danao City	Cebu City	34
Cebu City	Sibunga	34
Sibunga	Boljoon	35
Tubigon	Tagbilaran	32
Tagbilaran	Jagna	60
Tunga	Dalo	28
Dalo	Tacloban City	25
Dalo	Tolosa	10
Tolosa	Sogod	72
Sogod	Maasin	30
Bontoc	Hindang	24
Calbayog City	Wright	58
Sub-Total		956

MINDANAO

Dipolog City	Calamba	32
Calamba	Oroquieta City	20
Oroquieta City	Ozamis City	39
Ozamis City	Aurora	39
Aurora	Pagadian City	23
Pagadian City	Midsalip	15
Midsalip	R. Magsaysay	20
Aurora	Kapatagan	26
Kapatagan	Kolambugan	30
Kolambugan	Kauswagan	28
Kauswagan	Marawi City	30
Marawi City	Lumbatan	68
Lumbatan	Malabang	20
Malabang	Sultan Kudarat	62
Tagoloan	Balingasag	10
Balingasag	Kinogitan	41
Kinogitan	Gingoog City	40
Tacurong	Koronadal	20
Koronadal	Polamanok	35
Polamanok	Gen. Santos	20
Sub-Total		618
Grand Total		2,286

CONSTRUCTION OF TRANSMISSION LINES  
1978

LUZON

<u>From</u>	<u>To</u>	<u>Km. of Lines</u>
Atok	Mangkawayan	45
Mangkawayan	Bontoc	40
Tarlac	Paniqui	30
Quezon	Cabanatuan	15
Cabanatuan	Muñoz	30
Sub-Total		160

VISAYAS

Boac	Torrijos	30
San Jose	Roxas (Mindoro Occ.)	60
Roxas	Pinamalayan	60
Sara	Balasan	30
Balasan	Panitan	45
Panitan	Roxas City	15
Capiz City	San Carlos City	60
Dumaguete	Zamboanguita	45
Alegria	Dumanjog	35
Dumanjog	Sibunga	14
Ormoc City	Tunga	30
Sogod	Hinundayan	45
Aborlan	Puerto Princesa	60
Sub-Total		529

MINDANAO

Sindagan	Midsalip	80
Cagayan de Oro	Manolo Fortich	30
Surigao City	Alegria	35
Alegria	Gigaquit	15
Alegria	Tublay	45
Tublay	Butuan City	23
Butuan	Prosperidad	45
Prosperidad	Barobo	40
Barobo	Bislig	45
Malaybalay	Maramag	42
Maramag	Kibawe	20
Sultan Kudarat	Cotabato City	21
Cotabato City	Pikit	67
Malo	Pantukan	30
Pantukan	Mati	46
Koronadal	Surallah	23
Surallah	Kiamba	35
Gen. Santos	Alabel	19
Alabel	Malapatan	28
Sub-Total		689

Grand Total

1,378

CONSTRUCTION OF TRANSMISSION LINES  
1979

LUZON

<u>From</u>	<u>To</u>	<u>Km. of Lines</u>
Siniloan	Infanta	45
Siniloan	Baras	30
Mamburao	Puerto Galera	58
Puerto Galera	Calapan	35
Puerto Princesa	Roxas	90
Sub-Total		258

VISAYAS

Culasi	Sibalom	70
Pontevedra	Binalbagan	25
Binalbagan	Kabakalan	35
San Carlos City	Bindoy	85
Tubigon	Carmen	30
Carmen	Danao	23
Ubay	Mabini	20
Mabini	Jagna	30
Catarman	Calbayog City	35
Wright	Borongon	80
Wright	Sta. Rita	65
Tabango	Tunga	40
Sub-Total		538

MINDANAO

Cantilan	Tandag	35
Cantilan	Butuan City	60
Prosperidad	Bunawan	50
Matalam	Makilala	35
Makilala	Digos	35
Pagadian City	Dinas	45
Dinas	Margo sa Tubig	20
Sub-Total		280
Grand Total		1,076

CONSTRUCTION OF TRANSMISSION LINES  
1980

LUZON

<u>From</u>	<u>To</u>	<u>Km. of Lines</u>
Pudtol	Sanchez Mira	50
Sanchez Mira	Calamaniugan	75
Calamaniugan	Solana	60
Solana	Piat	30
Solana	Peñablanca	35
Peñablanca	Cabagan	26
Solana	Tabuk	50
Tabuk	Lubungan	20
Tabuk	Bontoc	60
Bontoc	Lagawe	35
Roxas	Ilagan	34
Ilagan	Cauayan	40
Cauayan	Santiago	30
Solano	Bambang	21
Pantabangan	Baler	40
Camiling	Paniqui	25
Pitogo	Mulanay	60
Lopez	Quezon	28
Lagonoy	Caramoan	30
Panganiban	Bato	40
Sub-Total		789

VISAYAS

Lavezares	Catarman	35
Catarman	Catubig	50
Oras	Borongan	65
Borongan	Quinapandan	50
Biliran	Tabango	85
Dagami	Tolosa	20
Tubigon	Jetafe	35
Sibalom	Dao	30
Sipalay	Kabakalan	60
Manjuyod	Mabinay	35
Amlan	Bayawan	43
Sub-Total		508

MINDANAO

Boston	Montevista	46
Boston	Baganga	56
Baganga	Karaga	23
Ipil	Naga	30
Naga	Kabasalan	40
Kabasalan	Siay	20
Sub-Total		215

Grand Total

1,512

COOPERATIVE PARTICIPATION  
TURN OVER - BOARD OF DIRECTORS

Cooperative	Board of Directors	1973	1974	1975	1976	1977
1. Abra	9	0	1	1	1	1
2. Aklan	10	0	0	1	0	0
3. Albay	6	0	1	0	0	0
4. Antique	8	0	1	1	0	0
5. Basilan	6	0	0	0	0	5
6. Bataan	12	0	1	1	1	1
7. Bohol	9	0	0	1	0	0
8. Bukidnon 1st	5	0	1	0	0	0
9. Bulacan 1st	6	0	1	0	0	1
10. Benguet	10	0	1	2	2	1
11. Cagayan	7	0	0	0	0	2
12. Camarines Sur	5	0	0	0	0	1
13. MORESCO	10	0	2	0	1	0
14. Mountain Prov.	8	0	0	1	0	0
15. Nueva Ecija	8	0	0	3	0	1
16. Nueva Ecija II	8	0	0	0	2	0
17. Nueva Vizcaya	6	0	0	0	2	0
18. Occ. Mindoro	5	0	0	0	0	2
19. Or. Mindoro	6	0	0	0	0	2
20. Palawan	5	0	0	0	1	0
21. Pampanga	10	0	1	3	0	1
22. Pangasinan	9	0	0	0	0	4
23. Quezon	12	0	0	1	1	0
24. Samar	6	0	0	1	0	0
25. Samar II	6	0	0	0	1	1
26. Sulu	8	0	1	0	1	0
27. Surigao del Sur	5	0	0	4	0	0
28. Talim	7	0	0	1	1	4
29. Tarlac	8	0	0	0	1	0
30. VRESCO	9	0	0	0	1	1
31. Zambales	5	0	2	1	0	1
32. Zamboanga City	5	0	0	2	0	1
33. Zamboanga del Sur	6	0	2	0	0	0
34. Iloilo	7	0	1	0	1	0
35. Capiz	7	0	0	1	0	1
36. Leyte I	10	0	0	4	0	0
37. Ilocos Norte	11	0	0	0	1	5
38. La Union	5	0	4	0	0	0
39. Lanao del Sur	7	0	0	0	1	0
40. Central Pangasinan	9	0	0	0	3	0
41. Davao Norte	7	0	0	0	3	0
42. 1st Catanduanes	5	0	0	0	2	0
43. Isabela	6	0	2	0	2	0
44. Cebu	7	0	1	0	0	0
45. Lanao del Norte	10	0	0	1	0	6
46. Marinduque	6	0	0	0	0	1
47. Laguna 1st	11	0	0	4	0	0
48. Lubang	6	0	0	0	3	0

Trained Cooperative Personnel

ACTIVITY	NO. OF SCHOOLS		NO. OF PARTICIPANTS			
	AS OF DEC-1975	CY 76	AS OF DEC. 1976	AS OF DEC-1975	CY 76	AS OF DEC. 1976
<b>I. FIELD TRAINING</b>						
1. PECT Seminar-Workshop	6	—	6	310	—	310
2. DEC Phase I	83	17	100	4965	817	5782
3. DEC Phase II	1	—	1	31	—	31
4. Coop Mgt. Course	12	2	14	642	119	761
5. Rural Brcasters Co.	1	—	1	68	—	68
6. GM's Conference	1	—	1	32	—	32
7. Coop Acctg. Course	3	1	4	105	62	167
8. Warehouse Optn. & Mgt. Course	6	—	6	230	—	230
9. Regional Conference for Bd. Dir. and Mgrs.	4	—	4	331	—	331
10. Annual Conf. for Pres. & GMs.	2	—	2	179	—	179
11. Conf.-Wrksp on Workplan Dev.	21	5	26	452	276	728
12. Workshop on Work Order Proc.	2	—	2	89	—	89
13. Member Service Dir. Sem.	—	2	2	—	69	69
14. Orientation Workshop on FAF	—	1	1	—	40	40
<b>II. IN-SERVICE TRAINING</b>						
<b>A. IN-HOUSE</b>						
1. Sem. on Rural Elec. Program for Middle Mgt. Person	1	—	1	42	—	42
2. Sem.-Workshop on Contract Adm. of NEA Middle Mgt. Personnel	1	—	1	30	—	30
3. Sem. on Feasibility Study Prep.	1	—	1	40	—	40
4. Trainors Trng. for Linemen	2	—	2	10	—	10
5. Skills Trng. for Drivers	3	—	3	62	—	62
6. NEA Inspectors Orientation Crs. on Pole Pres. Proc.	1	—	1	11	—	11
7. Clerks Skills Trng. Course	1	—	1	48	—	48
8. Personnel Dev. Inst.	6	2	8	303	103	406
9. Sem. of Review of Eng'g & Const. Methods	1	—	1	87	—	87
10. Lecture-Sem. of Records Mgt.	1	—	1	38	—	38
11. Skills Trng. for Janitors & Mess.	2	—	2	36	—	36
12. Usherettes Orient. Course	1	1	2	42	23	65
13. Course on Sec'l. Proficiency	2	—	2	118	—	118
14. 1st Aid Inst. Trng. Course	1	—	1	21	—	21
15. Trng. Course for Raters	2	—	2	44	—	44
16. Trng. Eval. & Plan. Conf.	2	1	3	42	23	65
17. Sem.-Workshop on Performance Rating	1	—	1	27	—	27
18. Fire Ext. Drill & Briefing	1	1	2	50	58	108
19. Briefing on Signal Com. Oprt. Proc.	1	1	2	52	50	102
20. Sem. on Contract Adm. (USA)	—	1	1	—	7	7
21. Orientation on Contract Adm.	1	—	1	58	—	58
22. Conus Observation Tour	11	1	12	73	9	82
23. Inspectors Course	1	—	1	25	—	25
24. Briefing on Protocol of the Social, Political & Eco. & Cultural Background of Afro-Asian Countries	—	1	1	—	61	61
25. Employee Dev. Crs.	—	1	1	—	168	168
26. Intro to Superv.	—	1	1	—	35	35
27. Responsible Parenthood & Family Planning Seminar	—	2	2	—	89	89
28. Power Use Planning Conf.	—	1	1	—	46	46
29. Mass Graduation	2	1	3	(390)	(228)	(628)

ACTIVITY	NO. OF SCHOOLS			NO. OF PARTICIPANTS		
	AS OF DEC-1975	CY 76	AS OF DEC. 1976	AS OF DEC-1975	CY 76	AS OF DEC. 1976
<b>B. LOCAL GRANTS</b>						
1 Annual Conv. of the Phil. Society for Trng & Dev.	2	—	2	3	—	3
2 Wrhso Optn. & Mgt. Course	2	1	3	4	2	6
3 First Aid Regional Conf. for Trng. & Dev.	1	—	1	2	—	2
4 5th Mgt. Congress	1	—	1	2	—	2
5 Trng. Officers Crs.	2	—	2	2	—	2
6 Sem. of Choral Cond. & Choreog.	1	—	1	1	—	1
7 Techniques of Safety Mgt.	1	—	1	1	—	1
8 Mgt. Trainers Crs.	1	—	1	1	—	1
9 Regional Sec.-Workshop of GTOAP	2	—	2	3	—	3
10 Purchasing Mgt. Sem.	1	—	1	1	—	1
11 Mgt. of Time	1	—	1	1	—	1
12 Small Bus. Mgt.	1	—	1	3	—	3
13 World Safety & Acc. Prevention Congress	1	—	1	1	—	1
14 Sem-Workshop on Power & Energy Conserv.	—	1	1	—	2	2
15 3rd Nat'l. Fire Safety Symp.	—	1	1	—	1	1
16 Prof. Sec'l Course	—	1	1	—	4	4
17 Sem. on Perception of Phil. Reality	—	1	1	—	1	1
18 Supervisory Mgt. Course	—	1	1	—	1	1
19 9th National Ind'l. Safety Conv.	—	1	1	—	2	2
20 4th Sem. for Action Officer	—	1	1	—	2	2
<b>III. ELECTRICAL TRADES</b>						
1 Linemen Course	72	15	87	1395	326	1721
2 Barangay Elec. Course	69	27	96	2354	774	3128
3 Plant Optra. Course	2	—	2	49	—	49
4 Adm. of Const. by Force Account	1	—	1	90	—	90
5 Plant Sup. Course	2	—	2	31	—	31
6 NETTP Trainers Conf. Wrkshp.	2	—	2	68	—	68
7 Sem. on Secondary Line Staking	3	1	4	72	27	99
8 Dist. Line Staking/Const. Superv. Seminar	1	—	1	185	—	185
9 Pole Preserv., Test & Inspect'n Seminar	1	1	2	23	21	44
10 Sem. on Sectionalizing & Fault Current Calculations	1	—	1	35	—	35
11 Sem. on Power Plant Optra. Maint. & Rehab.	—	1	1	—	12	12
12 Sem. Workshop on KWHM Calibration Testing & Inspection	—	3	3	—	138	138
13 Sem. on Transmission Line Design & Supv. of Construction	—	1	1	—	35	35
14 Lineman-Electrician Trnrs. Crse.	—	2	2	—	60	60
15 Scout Electrician Course	—	4	4	—	114	114
16 Primary Line Staking	—	1	1	—	25	25
<b>IV. SAFETY TRAINING</b>						
1 1st Indl. Safety Sem.	1	—	1	29	—	29
2 Safety Training Course	1	—	1	19	—	19
3 Coop Dist. Line Safe Maint. Course	1	—	1	37	—	37
4 Safety Trainers Course	3	—	3	88	—	88
5 Electrical Appliance Safety Sem.	2	—	2	47	—	47
6 Safety Training for Coop Persn'l.	21	21	42	1485	1051	2536

**GRAND TOTAL**

**388 1207 1725 4,653 19,378**

Commercial and Industrial Electrical Power Consumption

COOP	DATE	COMMERCIAL			INDUSTRIAL		
		CONN. A	KWH SOLD B	B/A	CONN. A	KWH SOLD B	B/A
Ilocos Norte	June 74		2978				
	June 75		2547				
	June 76	86	109988	1279			
	Mar 77	89	125110	1406	1	19920	19920
Ilocos Sur	July 74		30346				
	July 75		99602				
	Jun 76	427	93948	220			
	Apr 77	586	105115	179	13	45418	3494
La Union	Jan 74	4	48443	12111			
	Jun 75	86	18578	216	25	398448	15938
	Jun 76	661	80668	122	22	603508	27432
	Mar 77	889	78680	83	26	194639	7486
Abra	Sept 74		89932				
	June 75	78	22817	292	3	17251	5750
	June 76	129	13061	101	6	20098	3350
	Mar 77	142	29500	208	6	8092	1349
Benguet	Apr 74	-	-	-	-	2374440	-
	June 74	-	28594			2614680	-
	June 75	2160	350094	162	2	2736440	1368220
	June 76	2160	609977	282	3	3054200	1018067
	Apr 77	2186	1168963	535	3	305800	1016933
Central Pangasinan	June 76	606	198076	327	-	-	-
	Feb 77	1385	182676	132	-	-	-
Cagayan	June 76	10	498	50	-	-	-
	Jan 77	261	11928	55	1	300	300
Isabela	Feb 76	281	49662	177			
	June 76	567	56313	99			
	Mar 77	731	93572	128	9	4779	531
Zambales	June 75	182	16695	92			
	June 76	985	280408	285	2	27964	13982
	Mar 77	1294	390711	302	7	59956	8565
Pampanga	Jul 73		12258			36550	
	Jul 75	194	153795	793	27	153795	5696
	Jul 74	182	129441	711	17	313508	18442
	Jul 76	328	256230	781	45	462584	10279
	Apr 77	579	403699	697	47	617755	13144

<u>COOP</u>	<u>DATE</u>	<u>CONN.</u>		<u>COMMERCIAL</u>		<u>INDUSTRIAL</u>		
		<u>A</u>	<u>B</u>	<u>KWH SOLD</u>	<u>B/A</u>	<u>A</u>	<u>B</u>	<u>B/A</u>
Nueva Ecija 1	June 74	74	258	80611	312	23	202104	8787
	June 75	75	240	83717	349	34	217729	6404
	Jan 76	76	233	89105	382	59	301247	5106
	Mar 77	77	232	81813	353	72	420449	5840
Bataan	Jun 74	74	190	86101	453	19	162624	8559
	June 75	75	199	165909	834	14	427562	30540
	June 76	76	549	323657	589	20	596676	29834
	Feb 77	77	589	358769	609	18	362782	20155
Bulacan I	Feb 74	74	905	581519	643	25	110117	4405
	June 74	74	669	112379	168	27	78301	2900
	June 75	75	616	80119	130	63	163599	2597
	June 76	76	715	64352	90	67	210584	3143
	Feb 77	77	1037	131192	126	78	221192	2836
Sapang Palay	June 74	74	68	22373	329			
	June 75	75	108	66791	618			
	June 76	76	124	163769	1321			
	Mar 77	77	127	107137	843			
Talin	June 75	75	66	6151	93	1	16850	16850
	June 76	76	141	9521	67	1	12000	12000
	Feb 77	77	159	26160	164	1	22400	22400
Tarlac	June 75	75	421	70213	167	12	119273	9939
	June 76	76	354	33435	94	12	61499	5125
	Feb 77	77	870	95444	110	33	234732	7113
Laguna	June 74	74		79259				
	June 75	75	559	139208	249	14	102135	7295
	June 76	76	1010	190626	189	24	147340	6139
	Feb 77	77	1098	210234	191	25	163213	6528
Batangas	Feb 75	75		2381				
	June 75	75	52	5335	103			
	June 76	76	582	60062	103	8	163928	20491
	Mar 77	77	964	94842	98	12	234681	19557
Marinduque	Jul 74	74	77	2108	27			
	Jun 75	75	77	1914	25			
	Jun 76	76	140	5185	37			
	Mar 77	77	135	5092	38			
Palawan	Jul 75	75	236	36673	155			
	Jun 76	76	311	60934	196			
	Mar 77	77	370	65059	176			
Camarines Norte	Jun 76	76	320	109252	341	2	56550	28275
	Feb 77	77	915	89837	98	32	77247	2414

<u>COOP</u>	<u>DATE</u>	<u>COMMERCIAL</u>			<u>INDUSTRIAL</u>		
		<u>CONN.</u>	<u>KWH SOLD</u>	<u>B/A</u>	<u>CONN.</u>	<u>KWH SOLD</u>	<u>B/A</u>
		A	B		A	B	
Camarines Sur	Feb 74	22	599	27			
	June 74	44	3897	88	3	685	228
	June 75	210	12879	61	3	360	120
	June 76	322	26087	81	9	13026	1447
	Jan 77	354	16477	46	13	10093	776
Albay	Dec 74	26	6790	261			
	Jun 75	33	50963	1544			
	June 76	946	117436	124	13	38334	2949
	Feb 77	1573	160823	102	87	88840	1021
Sorsogon	Sep 74		6593				
	June 75		6914				
	June 76	183	8316	45			
	Feb 77	174	6020	33	9	1391	1552
Capiz	Jan 74	19	670	35			
	Jan 75	182	12191	67			
	Jan 76	236	21266	90	1	721	721
	Jan 77	209	25868	124	15	78599	5240
Vresco	Feb 74	126	13408	106	7	204832	29262
	Jul 74	137	16479	120	8	433604	54201
	Jul 75	500	84873	170	9	262666	29185
	Jul 76	779	149863	192	14	216281	15449
Iloilo	Jun 75	117	22541	193			
	Jun 76	241	22510	93	7	2522	360
	Mar 77	307	20072	65	24	69836	2910
Leyte I	Dec 75	2	2677	1339	1	40800	40800
	Jun 76	274	25245	92	2	67800	33900
	Jan 77	236	25510	108	2	58566	29283
Leyte II	Jul 74	348	108954	313	14	189326	13523
	Jun 75	1188	117824	99	40	309001	7725
	Jul 76	1159	293758	253	40	324163	8104
	Feb 77	1275	263053	206	39	249573	6399
Southern Leyte	Dec 75	25	4881	195			
	Jul 76	24	2919	122			
	Jan 77	24	1515	63			
Zamboanga City	June 74	2422	533645	220	2	2917	1459
	Jan 75	3044	731767	240	7	701	100
	June 76	3266	911279	279	10	106189	10619
	Mar 77	3267	1138679	348	6	149162	24860
Sulu	Jan 76	230	76341	332	2	8580	4290
	Mar 77	322	104489	324	2	4960	2480

<u>COOP</u>	<u>DA T E</u>	<u>COMMERCIAL</u>			<u>INDUSTRIAL</u>		
		<u>CONN.</u> A	<u>KWH SOLD</u> B	<u>B/A</u>	<u>CONN.</u> A	<u>KWH SOLD</u> B	<u>B/A</u>
Moresco	Oct 73	337	55104	163	2	74880	37400
	Oct 74	336	91139	249	1	47600	47600
	June 75	353	99666	282	3	88000	29333
	Jun 76	365	127954	350	3	19360	6453
	Feb 77	501	133253	266	3	74668	24889
Lanao Norte	Apr 75	125	14218	114	1	3800	3800
	June 76	352	42469	121	3	84400	84400
	Mar 77	793	94903	120	3	204620	204520
Lanao Sur	Aug 74	1	1893	1893	1	151432	151432
	Jun 75	1	4063	4063	1	163390	163390
	June 76	36	21419	595	1	158400	158400
	Jan 77	216	72484	336	1	107213	107213
Surigao del Sur	Nov 74	205	11423	56			
	Jun 75	516	119545	232			
	Jul 76	560	78670	140			
	Jan 77	554	113346	205			
Davao del Norte	Nov 75	128	2617	20			
	Jun 76	251	4409	18			
	Feb 77	1181	61083	52	9	20488	2276
Davao del Sur	Dec 75	242	52166	216			
	Jun 76	541	39341	73	25	15662	626
	Mar 77	671	50039	75	23	19218	836

/gie

PLANT REVENUE RATIO

ANNEX B-8  
Page 1 of 8 pages

<u>COOPERATIVES</u>	<u>GROSS PLANT (x 1000)</u>	<u>REVENUE LESS COST OF FUEL</u>	<u>A/B</u>
Ilocos Norte	12,654	1002	12.6
Ilocos Sur	12,143	909	13.4
La Union	8,803	1348	6.5
Abra	7,742	420	18.4
Benguet	8,963	5020	1.8
Central Pangasinan	7,083	462	15.3
Cagayan*	4,902		
Icabela*	4,925	170	28.9
Zambales	10,278	948	10.8
Sapang Palay	2,848	525	5.4
Pampanga	18,049	3416	5.3
Nueva Ecija I	14,915	2338	6.4
Nueva Ecija II	5,289	427	12.4
Bulacan I	12,501	<del>108</del> 1294	<del>12.4</del> 9.8
Bataan	14,598	2806	5.2
Tarlac	5,316	833	6.4
Talim	4,487	152	29.5
Laguna	6,929	1138	6.1
Batangas	14,010	1275	10.9
Marinduque*	2,429	41	59.2
Palawan*	6,333	286	22.1
Camarines Norte	7,619	499	15.3
Camarines Sur*	6,434	(41)	
Albay	8,888	1015	8.75
Sorsogon	938	60	15.6
Capiz	13,523	371	36.4
VHESCO	15,873	800	19.8
Iloilo	5,276	323	16.3
Samar I*	1,957	67	29.2
Samar II*	3,444	117	29.4
Leyte I*	19,934	408	36.6
Leyte II*	8,559	881	9.7
Southern Leyte	6,214	25	248.6
Zamboanga City*	11,023	1630	6.8
MONESCO*	13,025	1008	12.9
Lanao Norte	11,839	762	15.5
Lanao Sur	8,120	523	15.5
Surigao Sur	5,033	523	9.6
Davao Norte	9,350	58	161.2
Davao Sur	3,344	287	11.7
<u>Sulu</u>	<u>2,035</u>	<u>228</u>	<u>8.9</u>

\* Self generated Coops

\*\* Adjusted Self generated Coops

DEBT SERVICE COVERAGE  
GROSS MARGIN AS % OF REQUIRED MARGIN

ANNEX B-8  
Page 2 of 8 Pages

<u>COOPERATIVE</u>	<u>GROSS MARGIN</u>	<u>REQUIRED MARGIN</u>	<u>A/B x 100</u>
	<u>(Deficit)</u> <u>12 MONTH AVERAGE</u>	<u>AS PER NEA</u> <u>POLICY</u>	
Ilocos Norte	90	55	164
Ilocos Sur	32	19	168
La Union	54	21	257
Abra	(73)	20	
Pangasinan	329	20	1645
Central Pangasinan	54	23	235
Isabela	(19)	16	
Zambales	45	14	321
Sapang Dalay	31	6	517
Pampanga	83	44	189
Nueva Ecija I	80	45	178
Nueva Ecija II	77	15	513
Bulacan I	<del>11</del> 22	21	104
Bataan	131	36	364
Tarlac	15	6	250
Talim	(3)		
Laguna	41	30	137
Batangas	45	23	196
Marinduque	(12)	21	
Palawan	12	9	133
Camarines Norte	16	7	229
Camarines Sur	(22)	13	
Albay	135	37	365
Sorsogon	1	15	7
VRESCO	(28)		
Iloilo	10	27	37
Capiz	1	27	4
Samar I	6	6	100
Samar II	(7)		
Leyte I	5		
Leyte II	58	29	17
So. Leyte	1	25	232
Zamboanga City	56		
Sulu	1	13	362
MORESCO	19	8	4
Lanao del Norte	29		
Lanao del Sur	4	19	153
Surigao Sur	10	34	11
Davao Norte	(8)	22	45
Davao Sur	(1)	21	
		10	

CONSUMER PER KM. OF PRIMARY LINEANNEX B-8  
Page 3 of 8 pages

<u>COOPERATIVE</u>	<u>CONSUMER</u>	<u>B KM. OF PRIMARY LINE</u>	<u>A/B</u>
Ilocos Norte	15,918	280	57
Ilocos Sur	11,970	192	62
La Union	13,723	169	81
Abra	6,044	188	45
Benguet	17,290	203	85
Central Pangasinan	13,326	151	88
Cagayan	2,868	124	23
Cabala	3,952		
Zambales	15,371	138	111
Sapang Palay	4,555	36	127
Pampanga	44,214	612	72
Nueva Ecija I	19,938	470	42
Nueva Ecija II	10,028		
Bulacan I	23,784	341	70
Bataan	23,637	231	102
Tarlac	9,743	98	99
Talim, Rizal	3,585	42	85
Laguna	13,928	110	127
Batangas	13,163		
Marinduque	1,383	26	53
Palawan	1,551	13	119
Camarines Norte	5,805		
Camarines Sur	3,621		
Albay	11,977	182	66
Sorsogon	762		
VRESCO	11,026		
Iloilo	5,446		
Capiz	6,360	109	58
Samar I	1,245		
Samar II	2,199		
Leyte I	7,089		
Leyte II	7,763		
So. Leyte	1,652		
Zamboanga City	10,877	40	272
Sulu	2,187		
MORESCO	7,956	351	23
Lanao Norte	5,812	181	32
Lanao Sur	5,532	256	22
Surigao del Sur	5,341	66	81
Davao Norte	2,122	80	106
Davao Sur	2,236	21	106

<u>COOPERATIVE</u>	<u>A</u> <u>CUMULATIVE</u> <u>KWH</u> <u>SALES</u>	<u>B</u> <u>KM. OF</u> <u>PRIMARY</u> <u>LINE</u>	<u>A/B x 100</u>
Ilocos Norte	6,480	280	23
Ilocos Sur	6,198	192	32
La Union	10,951	169	65
Abra	2,618	133	20
Bonrost	74,979	203	369
Central Pangasinan	3,059	151	20
Cagayan	415	124	3
Isabela	1,773		
Zambales	10,990	138	80
Bataan	23,857	231	03
Pampanga	30,876	612	50
Nueva Ecija I	14,686	470	31
Nueva Ecija II	4,121		
Bulacan I	14,351	341	42
Sapang Dalay	3,303	36	92
Tarlac	5,422	98	55
Talim	1,156	42	28
Laguna	9,355	110	85
Batangas	8,609		
Marinduque	431	26	17
Palawan	1,417	13	109
Camarines Norte	3,004		
Camarines Sur	1,178		
Albay	6,786	182	37
Sorsogon	243		
VRESGO	11,512		
Iloilo	2,292		
Capiz	3,882	109	36
Samar I	420		
Samar II	1,404		
Leyte I	3,881		
Leyte II	11,379		
So. Leyte	317		
Zamboanga City	19,747	40	494
Sulu	2,611		
MORESCO	12,265	351	35
Lanao Norte	4,922	181	27
Lanao Sur	4,992	256	20
Surigao Sur	3,930	66	60
Davao Norte	337	20	17
Davao Sur	1,290	21	61

<u>COOPERATIVE</u>	<u>A</u> <u>GROSS PLANT</u> <u>(P'000)</u>	<u>B</u> <u>TOTAL RECEIVING</u> <u>SERVICES</u>	<u>A/B</u>
Ilocos Norte	12,654	15,918	795
Ilocos Sur	12,143	11,970	1,014
La Union	8,803	13,723	641
Abra	7,742	6,044	1,280
Benguet	8,963	17,290	518
Central Pangasinan	7,083	13,326	532
Cagayan	4,902	2,868	1,709
Ibabela	4,925	3,952	1,246
Zambales	10,278	15,371	669
Sapang Palay	2,848	4,555	625
Pampanga	18,049	44,214	408
Nueva Ecija I	14,915	19,938	748
Nueva Ecija II	5,289	10,028	527
Bulacan I	12,501	23,784	526
Bataan	14,598	23,637	618
Tarlac	5,316	9,743	546
Talim, Rizal	4,487	3,585	1,252
Laguna	6,929	13,928	497
Batangas	14,010	13,163	1,064
Marinduque	2,429	1,383	1,756
Palawan	6,333	1,551	4,083
Camarines Norte	7,619	5,895	1,312
Camarines Sur	6,434	3,621	1,777
Albay	8,888	11,977	742
Sorsogon	938	762	1,231
VRESCO	15,873	11,026	1,440
Iloilo	5,276	5,996	880
Capis	15,150	6,360	2,382
Samar I	1,957	1,249	1,572
Samar II	3,444	2,199	1,566
Leyte I	14,934	7,089	2,107
Leyte II	8,559	7,763	1,103
So. Leyte	6,214	1,652	3,762
Zamboanga City	11,023	10,877	1,013
Sulu	2,035	2,187	930
MCRESCO	13,025	7,936	1,637
Lanao del Norte	11,839	5,812	2,037
Lanao del Sur	8,120	5,532	1,468
Surigao del Sur	5,033	5,341	942
Davao del Norte	9,350	3,493	2,677
Davao del Sur	3,344	2,236	1,496

<u>COOPERATIVE</u>	<u>OTHER CASH OPERATING EXPENSE</u>	<u>OTHER CASH OPERATING EXP./ KWH SOLD (In Mils)</u>
Ilocos Norte	670	103
Ilocos Sur	525	85
La Union	726	66
Abra	419	160
Benguet	1096	15
Central Pangasinan	464	152
Cagayan	139	335
Isabela	391	221
Zambales	880	80
Bataan	1239	52
Pampanga	2163	70
Nueva Ecija I	1379	94
Nueva Ecija II	525	127
Bulacan	1015	71
Sapang Palay	266	81
Tarlac	657	121
Talin	199	172
Laguna	635	68
Batangas	737	86
Marinduque	175	406
Palawan	140	99
Camarines Norte	371	124
Camarines Sur	198	168
Albay	924	136
Sorsogon	41	169
VRESCO	1015	88
Iloilo	308	134
Capiz	374	96
Samar I	185	440
Samar II	165	118
Leyte I	398	103
Leyte II	696	61
So. Leyte	19	60
Zamboanga City	1061	54
Sulu	233	89
MOHESCO	854	70
Lanao del Norte	417	85
Lanao del Sur	415	83
Surigao del Sur	523	133
Davao del Norte	155	460
Davao del Sur	292	226
Maguindanao	35	

SYSTEM LOSS (GAIN)

<u>COOPERATIVE</u>	<u>PER CENT</u>
Ilocos Norte	20
Ilocos Sur	14
La Union	18
Abra	16
Benguet	18
Central Pangasinan	29
Cagayan	10
Isabela	38
Zambales	12
Bataan	29
Pampanga	18
Nueva Ecija I	28
Nueva Ecija II	41
Malacan	27
Sapang Palay	4
Talim	30
Tarlac	23
Laguna	11
Batangas	13
Marinduque	12
Pulawan	17
Camarines Norte	23
Camarines Sur	11
Albay	22
Marosogon	21
VRECO	18
Iloilo	11
Capiz	12
Samar I	13
Samar II	28
Leyte I	19
Leyte II	24
So. Leyte	17
Zamboanga City	29
Sulu	16
MORESCO	10
Lanao del Norte	1
Lanao del Sur	15
Surigao del Sur	10
Davao del Norte	19
Davao del Sur	34

PERCENTAGE OF BILLS COLLECTED

<u>COOPERATIVE</u>	<u>REPORT MONTH</u>	<u>% OF COLLECTION</u>
Ilocos Norte	-	-
Ilocos Sur	March	80
Ma Union	February	92
Abra	January	96
Benguet	February	85
Central Pangasinan	February	82
Cagayan	-	-
Isabela	March	99
Zambales	March	85
Sapang Palay	February	60
Pampanga	March	92
Nueva Ecija I	March	108
Nueva Ecija II	February	97
Bulacan I	February	96
Bataan	March	114
Tarlac	April	90
Talim	-	-
Laguna	February	88
Batangas	March	98
Marinduque	March	88
Palawan	March	98
Camarines Norte	February	98
Camarines Sur	-	-
Albay	-	-
Sorsogon	January	93
VRESCO	December	100
Iloilo	March	98
Samar I	February	78
Samar II	December	98
Leyte I	-	-
Leyte II	March	118
So. Leyte	February	91
Zamboanga City	March	100
Sulu	February	64
MCRESO	-	-
Lanao Norte	February	84
Lanao Sur	-	-
Davao Norte	January	71
Davao Sur	March	116
VRESCO	January	95
Capiz	January	97

INTERNATIONAL RURAL ELECTRIFICATION CENTER  
IN THE PHILIPPINES

INTRODUCTION

It was ten (10) years ago in 1967, when USAID financed the preparation of feasibility studies for the organization and establishment of two (2) pilot cooperatives for rural electrification in the Philippines. These two (2) pilot projects, MORESCO and VRESCO, were organized, developed, and energized in 1971. Since then, the Philippines had embarked into a massive rural electrification program through electric cooperatives aiming for total electrification by 1990. As of March 1977, 66 electric cooperatives were actually providing service to over 500,000 households in about 500 town centers and 4,500 barrios throughout the Philippines. These cooperatives have been patterned after the electric cooperatives in the United States. Technical standards and cooperative concepts were adopted from the Rural Electrification Administration (REA) and the National Rural Electric Cooperatives Association (NRECA), respectively.

Electric cooperatives in the Philippines are developing at a fantastic rate. In 1977, for example, the cooperatives program aims at providing electricity to an additional 250 town centers and 2,500 barrios. By the end of 1977, about 700,000 households will be enjoying the benefits of electricity. Almost all the cooperatives so far organized are proving to be financially and institutionally viable.

THE PHILIPPINES AS A TRAINING SITE

The electric cooperative movement in the Philippines is fast becoming a success story. That the Philippines is a developing country, that it is a country where past cooperative movements have failed, makes it an ideal model for other developing countries who would like to develop electric cooperatives. It is for this reason that USAID and NEA decided to jointly sponsor the setting up of an International Training Center in the Philippines.

TYPES OF TRAINING

The types of training envisioned may be categorized into three (3) levels:

A. General Overview - This is designed for the ministerial and sub-ministerial levels. The training consists of a study-tour to one (1) pilot project and to two (2) other cooperatives. It also includes a briefing at the NEA office.

B. Middle Management Training - This training is given to planners and implementors of electric cooperative programs. This training not only imparts knowledge to the participants on the technical, economic, financial, and

institutional aspects of electric cooperatives but also gives them some insights on how to develop a rural electrification program in their respective countries.

C. Lower Level Training - This training is aimed at developing trainors on basic subjects such as linemen and electrician training, power plant operations, etc. After graduation, the trainors will return to their respective countries to teach the courses.

#### TRAINING COURSES IN 1976

Two (2) courses were offered in 1976. In March, a 10-day conference study-tour was conducted for participants of ten (10) countries, namely:

Bangladesh	Papua New Guinea
Bolivia	Pakistan
India	Thailand
Indonesia	United States of America
Jordan	Philippines

The conference study-tour started with visits to three (3) electric cooperatives, namely : the Misamis Oriental Electric Service Cooperative, Inc. (MORESCO), located 450 miles southeast of Manila; the Albay Electric Cooperative, Inc. (ALECO), which is about 200 miles southeast of Manila; and the La Union Electric Cooperative, Inc. (LUELCO), located at about 150 miles north of Manila. The conference-study tour ended with a 3 day conference in Manila.

As a follow-up to the March 1976 conference study-tour, USAID and NEA again jointly-sponsored in August, a four-week conference-workshop in the Philippines on "Developing a National Program on Rural Electrification." There were eleven (11) participants from Bangladesh, Indonesia and Pakistan. These participants are the potential leaders of the rural electrification programs in their countries.

Like the March seminar, the August conference-workshop started with a two-week study-tour of selected electric cooperatives. The participants visited MORESCO and three other cooperatives in Luzon.

The participants produced workshop outputs on the following subjects:

Planning physical targets  
Planning Institutional targets

Training program  
Pole manufacturing plants  
Materials processing, storage and handling

During these workshops the participants planned the strategies for their respective countries. They decided on the year they will attain total electrification, on the number of cooperatives that will be required, at the rate these cooperatives will be organized. They also worked on the requirements of their programs on say, the number of electric poles, the location and number of warehouses, and the training of manpower, and the annual cost.

### TRAINING COURSES IN 1977

In January and February, a 6-week seminar-workshop was conducted for 23 participants from Bangladesh, Indonesia and Pakistan. The seminar focused on the "Initial Steps on Electric Cooperative Development." The involved visits to the two (2) pilot electric cooperatives and to six (6) other cooperatives in Luzon. The participants observed the actual organization of a cooperative. They observed the facilities for the training of linemen and electricians. They were also given lectures on the selection of a cooperative area; the preparation of feasibility studies; the organization, incorporation, and registration of cooperatives; the cooperatives program on training and on information. Finally, the participants prepared specific and immediate plans for the implementation of these activities.

In June and July, the NEA in coordination with the NRECA will conduct a 60-day course for 12 engineers and technicians from Bangladesh, on basic subjects such as warehouse operations and management, distribution line staking, sectionalizing fault current, an inspector's course, etc. The course will involve both lectures and practicum.

Near the end of the year, a middle management course on engineering and finance will be conducted. The course will involve the training of prospective heads of the engineering and finance departments of the rural electrification offices of Bangladesh, Indonesia, and Pakistan. The participants will be given lectures on the overall engineering and financial aspects of rural electrification so that they may be able to evolve immediate plans for the construction of their physical facilities and the setting up of the organizations which will implement both construction and financial plans.

### OTHER TRAINING COURSES

It had been our experience that for rural electrification to succeed, the people running the program must not only be knowledgeable on the program

but they must, above all, be dedicated. In the Philippines, all general managers and members of the board of directors of electric cooperatives are required to attend a seminar in one of our pilot projects - MORESCO. The participants observe actual cooperative operations. They see how the physical facilities look like, and the type of houses of the people getting electric service. They meet and talk with the members and they sit-in at board meetings. Thus they experience the benefits of the program. We feel that the members of the board of new cooperatives in Bangladesh, Indonesia, and Pakistan should also go through this course, that initially, this course should be conducted in the Philippines until such time that there will be pilot projects already in their respective countries.

It will require a lot of trained people to implement a total electrification program. Most of the training activities have to be conducted in the provinces. It is envisioned that we will set up training courses in the Philippines for trainors of such courses as linemen and electricians training, power plant operations, accounting work order procedures, meter reading and billing. The trainors will return to their countries accompanied by a Filipino assistant and together, they will set up the training program in their countries.

#### FUTURE ASPECT OF THE PROGRAM

Should the training program in the Philippines prove successful, it can be institutionalized. Thus, it can readily expand to accommodate participants from various developing countries.

## POWER GENERATION

The Philippine Rural Electrification Program distributes power obtained from two sources:

1. The majority of the power is purchased, by individual cooperatives, from the National Power Corporation (NPC) grid at the prevailing rates and distributed through the cooperative's lines; and
2. Some power is produced by the individual cooperatives with their own generating facilities (supervised and inspected by NEA).

In 1976, NPC sold over 343 million Kilowatt Hours (KWH) of electrical power to the cooperatives, while the individual cooperatives generated approximately 40 million KWH (for sale to cooperative members). A summary of NPC's power generating capacities, and plant expansion plans, is provided by region in Table 1, page 2 of this Annex. In addition, Chart 1 provides a graphical representation of the power source mix of NPC owned generating facilities.

The individual cooperative owned generating facilities along with their costs listed in Table 2. This list shows existing facilities as well as those planned to come into operation in 1977 through 1980. The majority of the new cooperative power generating equipment was purchased through Ex financing provided by the French Government in 1974. Generating equipment from this French loan is now in country and approximately 18.5 MW capacity is operational.

Note: A more complete analysis of NPC generating plans can be obtained from Asia/PD.

Table 1  
NPC POWER GENERATING EQUIPMENT

Luzon:

Hydros -

1. Ambuklao	-	75	MW
2. Angat	-	212	MW
3. Binga	-	100	MW
4. Caliraya	-	32	MW
5. Barit	-	1.8	MW
6. Cawayan	-	.4	MW
7. Balongbong	-	.2	MW
8. Pantabangan	-	100	MW

Thermal -

1. Bataan #1	-	75	MW
2. Bataan #2	-	150	MW

Diesel -

1. Ligao	-	3	MW
2. Tiwi	-	<u>2.5</u>	MW
Total	-	751.9	MW

Visayas:

Hydros -

1. Loboc	-	1.2	MW
2. Amlan	-	<u>00.8</u>	MW
Total	-	2.0	MW

Mindanao:

Hydros -

1. Ma. Cristina (Agus VI)	-	200	MW
2. Agusan	-	2	MW
3. Talomo System	-	<u>3.1</u>	MW
Total	-	205.1	MW

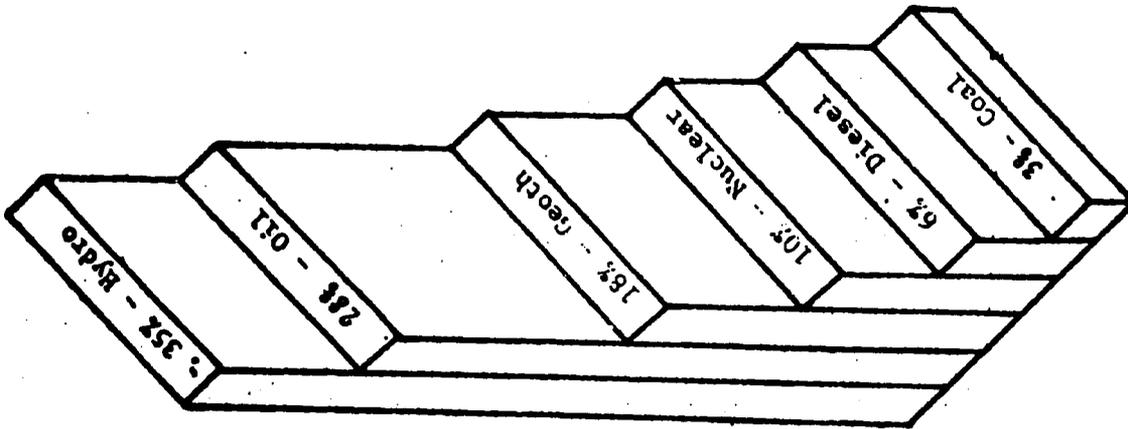
Table 2  
POWER PLANT PROJECTS

COMPLETED		ON-GOING	
COOPERATIVE	PROJECT COST (P1000)	COOPERATIVE	PROJECT COST (P1000)
1. Isabela	789	1. Quezon	42
	18	2. Mt. Province	56
	312	3. Samar II	2600
	140		280
2. Mindoro Or.	29		700
	275	3. Negros Occ.	540
	15		121
3. Cagayan	18		209
	793	6. Antique	90
	165	7. Sorsogon	320
4. Catanduanes	1,564	8. Central Negros	28
	111	Others	13988 <sup>2/</sup>
5. Marinduque	28		
6. Aklan	193		
7. Samar I	124		
8. Leyte II	666	TOTAL	18, 974
9. Tawi-Tawi	8		
10. Cagayan de Sulu	8		
11. Cebu	79		
Others	2783 <sup>1/</sup>		
TOTAL	8, 118		

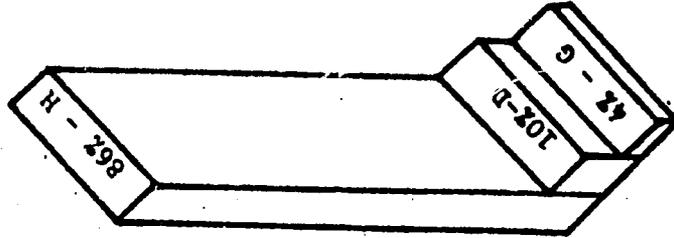
<sup>1/</sup> Minor projects e. g. hauling, soil exploration and rehab of gen-set.

<sup>2/</sup> Installation, hauling and construction of power plant facilities.

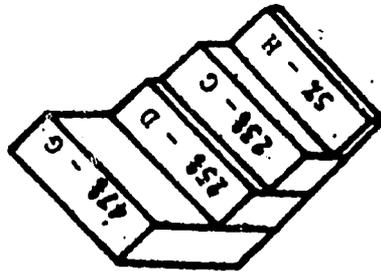
PERCENTAGE ENERGY SOURCE PROFILE  
CALENDAR YEAR 1987  
(In % GWH)



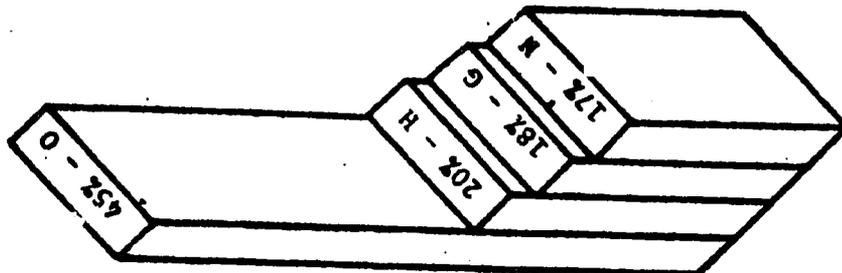
OVERALL  
(37,889 GWH)



MINDANAO  
(9628 GWH)



VISAYAS  
(4592 GWH)

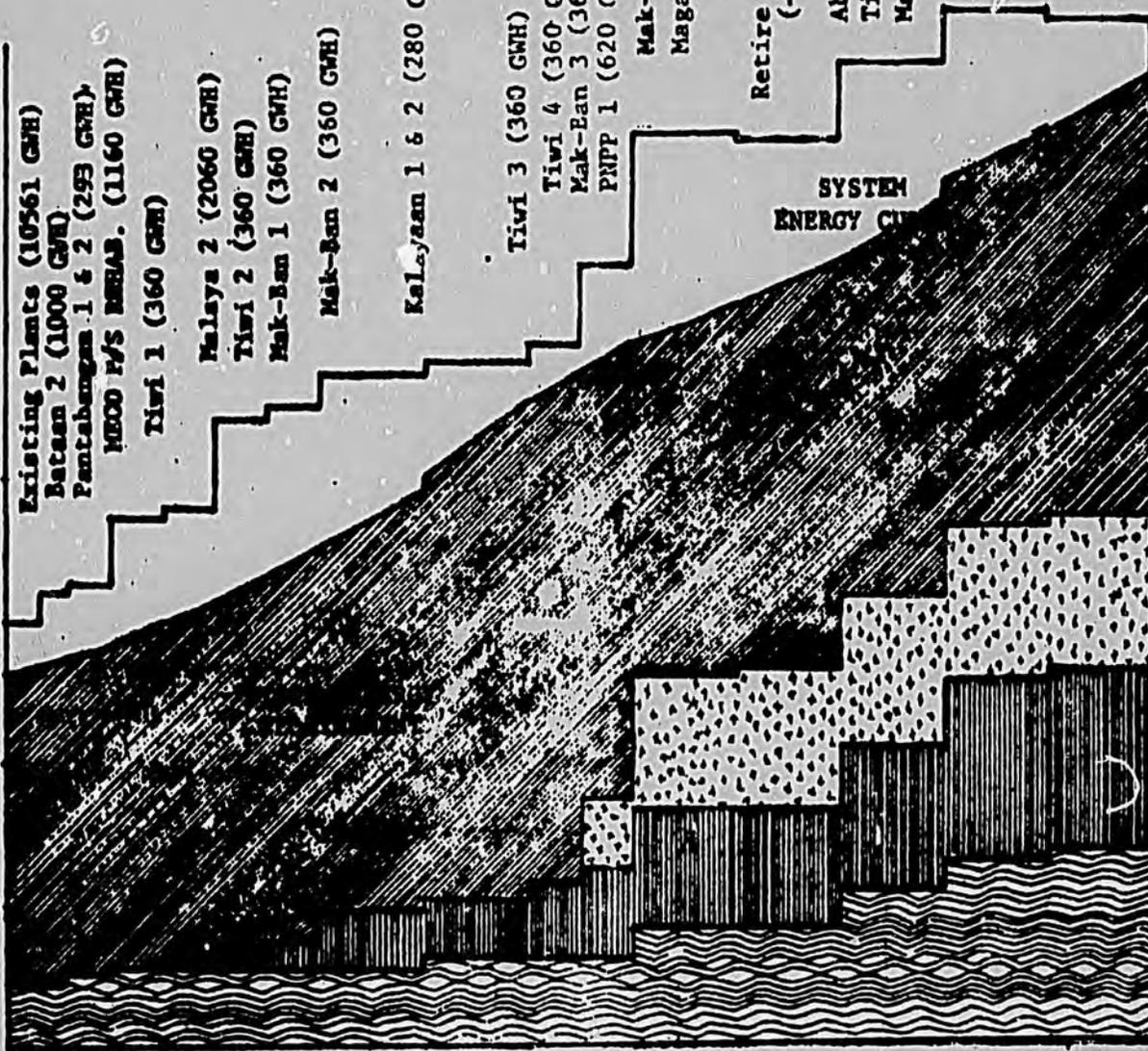


L U Z O N  
(23,669 GWH)

### LUZON POWER GRID SYSTEM ENERGY REQUIREMENT AND SUPPLY CURVE

DEMAND-HOUR

24500  
21000  
17500  
14000  
10500  
7000  
3500



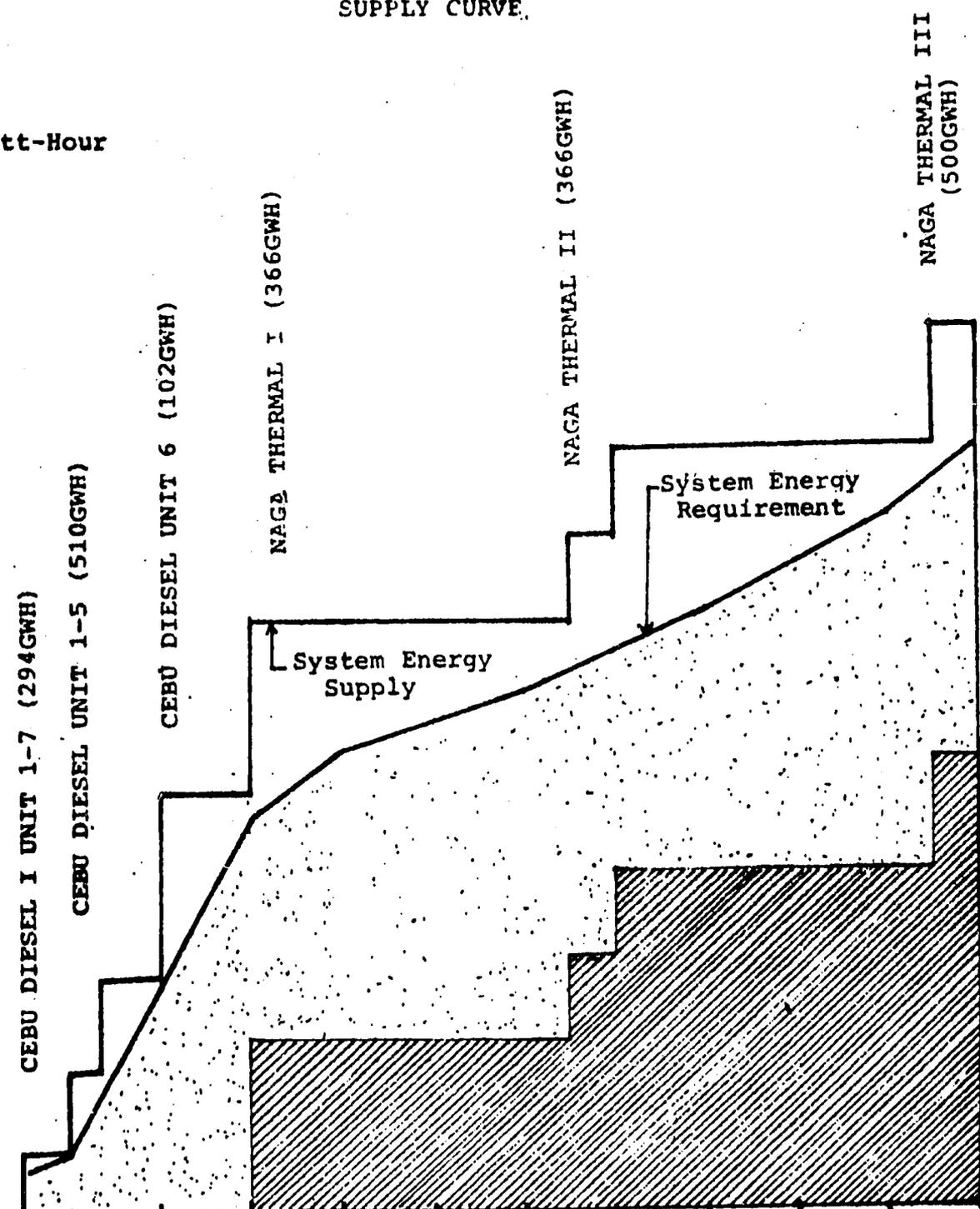
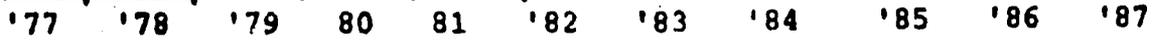
1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987

CALENDAR YEAR

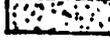
HYDRO  GEO  NUCLEAR  THERMAL 

### CEBU POWER GRID SYSTEM ENERGY REQUIREMENT AND SUPPLY CURVE.

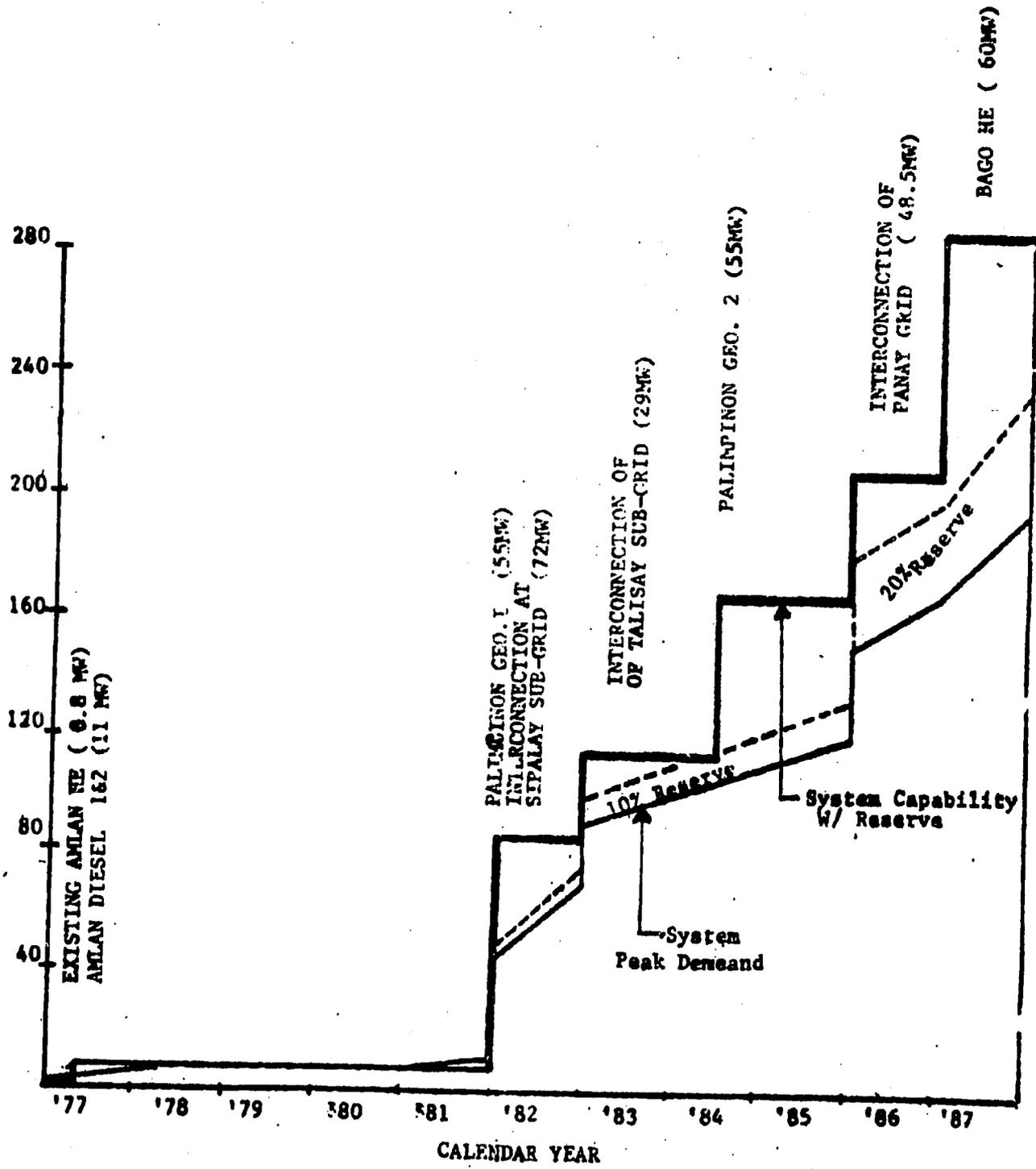
Gigawatt-Hour



THERMAL 

DIESEL 

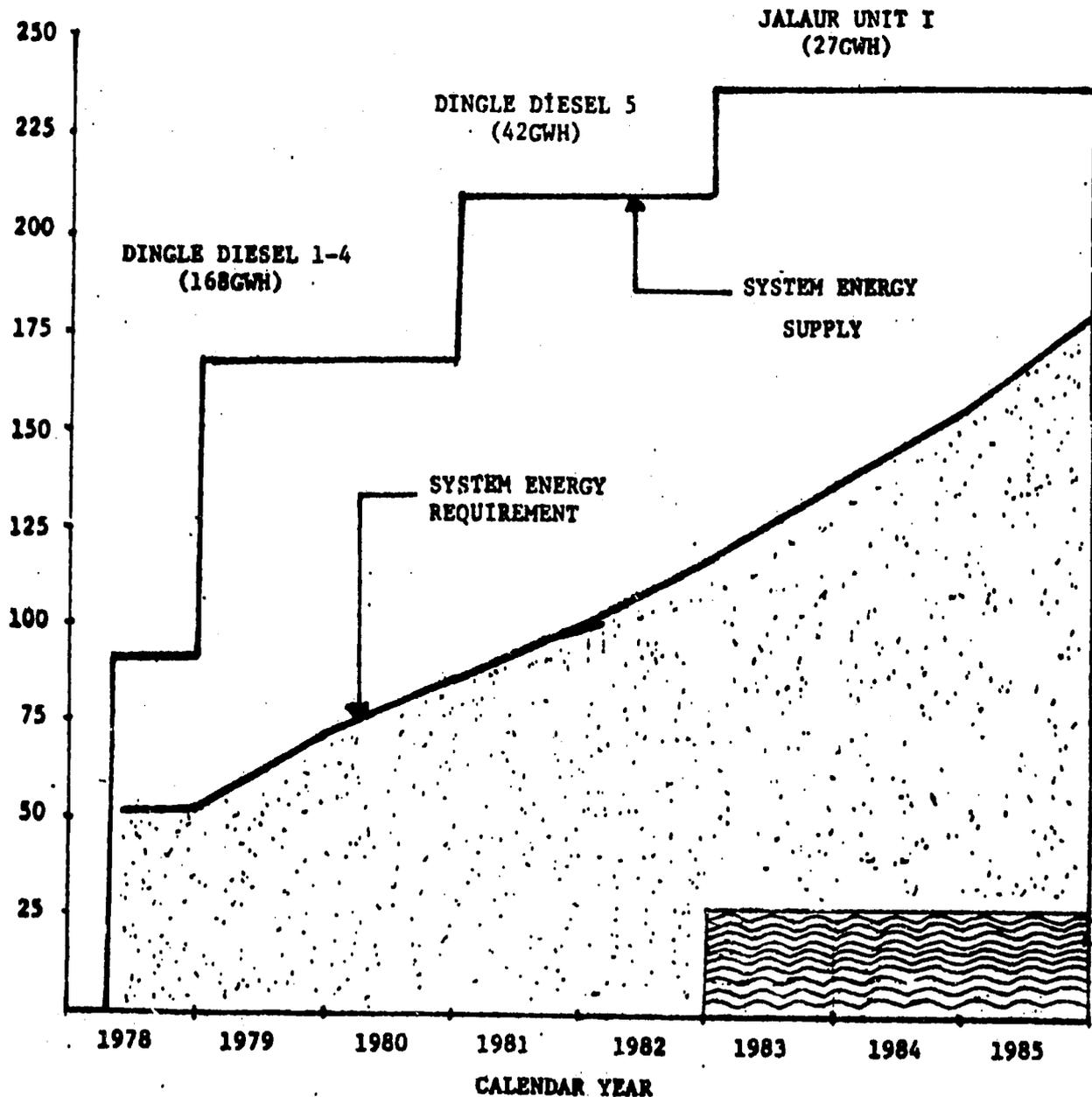
NEGROS POWER GRID  
SYSTEM PEAK DEMAND  
AND  
CAPABILITY CURVE  
(w/ SUB-GRID INTERCONNECTION)



PANAY POWER GRID  
SYSTEM ENERGY REQUIREMENT  
AND  
SUPPLY CURVE

MEGAWATT-HOUR

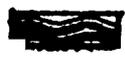
INTERCONNECTED TO NEGROS

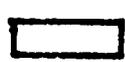


DINGLE DIESEL 1-4  
(168GWH)

DINGLE DIESEL 5  
(42GWH)

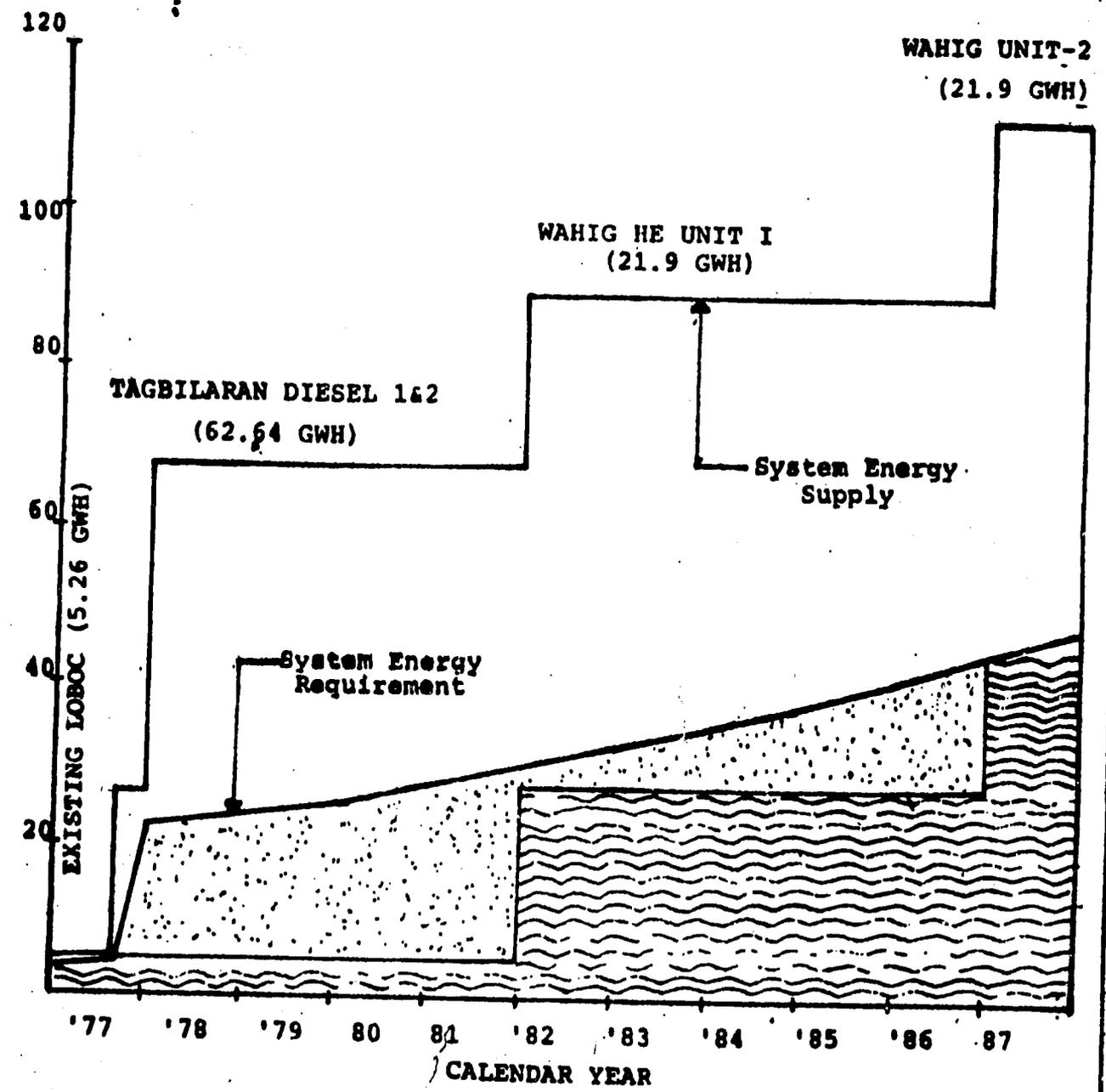
JALOUR UNIT I  
(27GWH)

HYDRO 

DIESEL 

BOHOL POWER GRID  
SYSTEM ENERGY REQUIREMENT  
AND  
SUPPLY CURVE

Gigawatt -hour



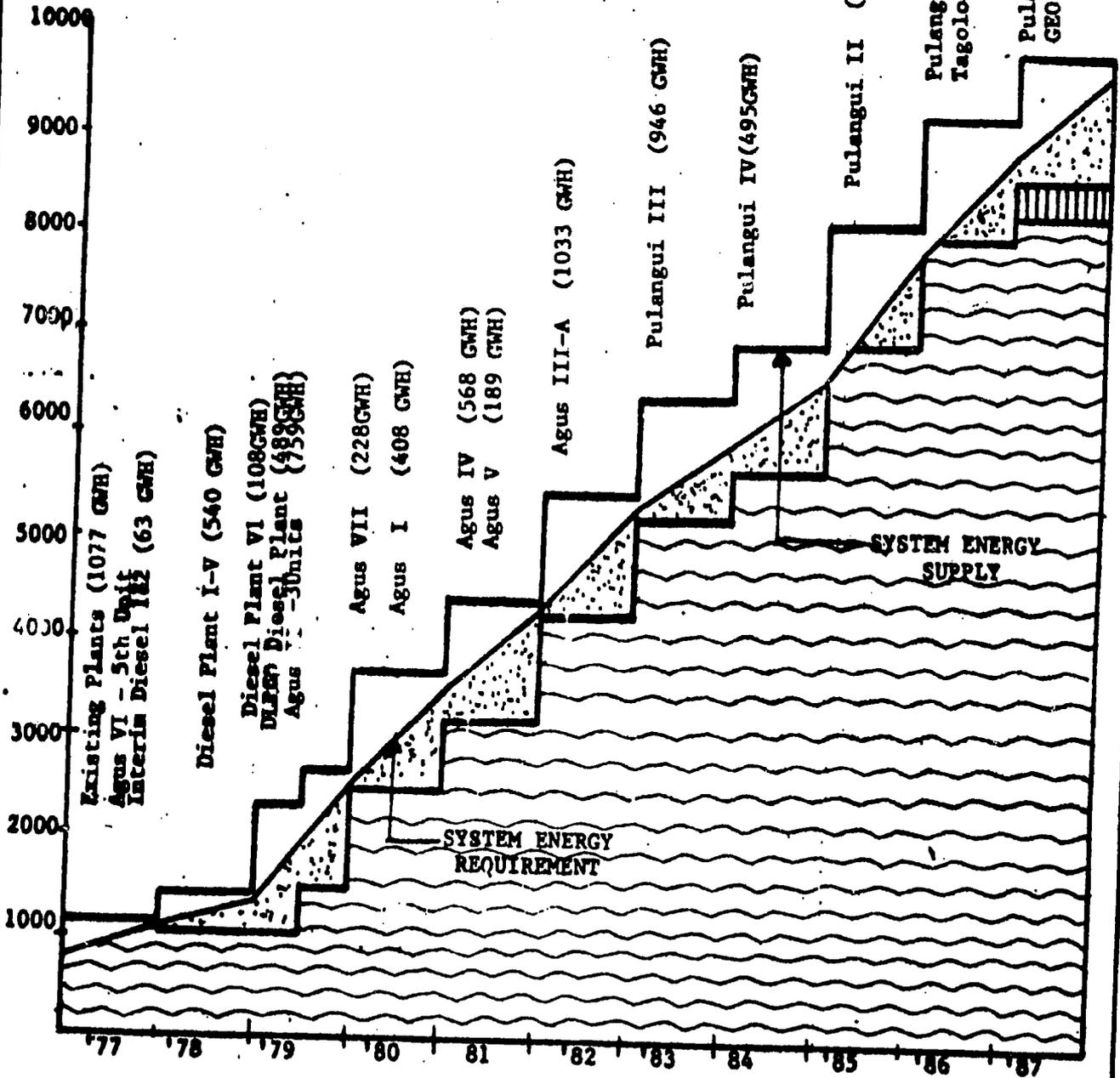
HYDRO



DIESEL



MINDANAO GRID  
SYSTEM ENERGY REQUIREMENT  
AND  
SUPPLY CURVE



HYDRO



GEO.



DIESEL





**Project Performance Tracking Network Chart**

Country:	Project No:	Project Title:	Date:	/X/ Original / / Revision #	Apprvd:
Philippines	492-0248	Rural Electrification V	15 June 7	/ /	-
<b><u>CPI DESCRIPTION</u></b>					
1) June 1977	Submit PP for RE V Loan	14) June 1978	IBRD Appraisal Completed		
2) November 1977	RE V Loan Authorized	15) June 1978	Issue initial IFB for IBRD Loan		
3) December 1977	Issue Initial IFB under RE V Loan	16) July 1978	Final delivery Commodities under RE Loan IV.		
4) December 1977	RE V Loan Agreement Signed	17) September 1978	Condition of Agreement/Acceptance for IBRD Loan		
5) December 1977	One cooperative organized in every province (except for small island sub-provinces)	18) September 1978	Contracts for Commodities under IBRD loan awarded		
6) December 1977	House Connections reach 750,000	19) November 1978	Final delivery of Commodities under RE V Loan		
7) December 1977	All commodities for RE III Loan, delivered	20) December 1978	House connections reach 1,000,000		
8) December 1977	IFB Issued under RE V	21) December 1978	Second Phase Evaluation Completed (NELCOR II)		
9) January 1978	Final Evaluation Report (NELCOR I Survey) Completed	22) January 1979	Initial Delivery of Commodities under IBRD Loan		
10) February 1978	Initial L/Com under RE V Loan issued.	23) June 1979	First \$12.5 million IBRD Loan commodities delivered		
11) February 1978	Final IFB issued under RE V Loan	24) June 1979	ADB Loan Approved		
12) April 1978	Initial delivery of Commodities under RE V Loan	25) July 1979	Issue IFB for ADB Loan		

**Project Performance Tracking Network Chart**

Country:	Project No:	Project Title:	Date:	Apprvd:
Philippines	492-0248	Rural Electrification V	15 June 77 / X / Original / / Revision #	
<u>CPI DESCRIPTION</u>				
26) September 1979 Issue IFB for second tranche IBRD loan				
27) October 1979 Award Contracts for Commodities under ADB Loan				
28) December 1979 Award Contracts for Commodities under IBRD Loan				
29) April 1980 Initial Delivery of Materials under IBRD				

CHECKLIST OF STATUTORY CRITERIA

A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent pattern of gross violations of internationally recognized human rights? Yes.
  
2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. government personnel or their dependents, or from entering the U.S. unlawfully? No. GOP cooperates with U.S. in combating drug abuse.
  
3. FAA Sec. 620 (a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba? No.
  
4. FAA Sec. 620 (b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? Yes
  
5. FAA Sec. 620 (c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government? No
  
6. FAA Sec. 620 (e) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned No

by them without taking steps to discharge its obligations toward such citizens or entities?

7. FAA Sec. 620 (f); App. Sec. 108. Is recipient country a Communist Country? Will assistance be provided to the Democratic Republic of Vietnam (North Vietnam), South Vietnam, Cambodia or Laos? No to both questions
8. FAA Sec. 620 (i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? No
9. FAA Sec. 620 (j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? No
10. FAA Sec. 620 (l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason? NA
11. FAA Sec. 620 (o); Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters. NA
- a. has any deduction required by Fishermen's Protective Act been made?
- b. has complete denial of assistance been considered by AID administrator?
12. FAA Sec. 620 (q); App. Sec. 504. (a) is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default? (a) No (b) No

13. FAA Sec. 620 (s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).  
Less than 17% of the national budget goes into defense. The amount of foreign exchange spent on military equipment is negligible. To the best of our knowledge no funds have been spent on sophisticated weapons.
14. FAA Sec. 620 (t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?  
No to first question
15. FAA Sec. 620 (u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?  
The country is not in default vis-a-vis its U.N. dues and assessments
16. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?  
No
17. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?  
No
18. FAA Sec. 669. Has the country delivered or received nuclear reprocessing or enrichment equipment, materials or technology, without specified arrangements on safeguards, etc.?  
No
19. FAA Sec. 901. Has the country denied its citizens the right or opportunity to emigrate?  
No

**B. FUNDING CRITERIA FOR COUNTRY**

**1. Development Assistance Country Criteria**

- a. FAA Sec. 102(c), (d). Have criteria been established, and taken into account,  
Yes, criteria have been established and will be

to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.

b. FAA Sec. 201 (b) (5), (7) & (8); Sec. 200; 211(a) (4), (7). Describe extent to which country is:

- (1) Making appropriate efforts to increase food production and improve means for food storage and distribution.
- (2) Creating a favorable climate for foreign and domestic private enterprise and investment.
- (3) Increasing the public's role in the developmental process.
- (4) (a) Allocating available budgetary resources to development.  
  
(b) Diverting such resources for unnecessary military expenditures and intervention in affairs of other free and independent nations.
- (5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure

refined in FY 78 under an AID financed project entitled "Economic and Social Impact Analysis."

The GOP's Four-Year Development Plan (74-77) states that increased food production is a priority goal.

The GOP has created and does maintain a favorable climate for both foreign and domestic investment.

The GOP has embarked upon a land reform program to transfer ownership of land to small farmers. Also, through the local governments, the GOP is trying to encourage increase local participant in planning and development.

About 65% of the national budget is allocated for economic and social development.

Less than 17% of national budget is spent on defense.

The Philippines has traditionally espoused the basic principles

arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

of a free and open society. On Sept. 22, 1972, Pres. Marcos, citing a serious threat from both the extreme left and right, invoked martial law. Ruling by decree, he ordered accelerated implementation of needed reforms designed to reduce widespread crime and corruption and to speed development efforts aimed especially at the lower income groups. In this regard he strongly encouraged the rural electrification program and inaugurated a national all-encompassing land reform program. Efforts were also aimed at strengthening local and provincial government units and increasing government revenues through tax reform and improved tax administration. However, under martial law, political activity and freedom of the press have been curtailed, and certain organizations and activities (e.g., those involving organized labor or students) are closely watched.

- (6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

Over the past six years the Philippine government has placed increasing emphasis on rural development in an effort to narrow the gap between the rich and the poor, to increase employment opportunities, raise the income levels of the rural population, and to improve the level of living. Heavy invest-

ments are being made in Rural Electrification, transportation, irrigation agrarian reform, farmer support services, agriculture production, nutrition, and education. Greatly increased external assistance from various bilateral and international donors over the past four years has been directed almost entirely to the rural sector.

c. FAA Sec. 201(b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?

Yes

d. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid through international organizations, or regional programs?

No

2. Security Supporting Assistance Country Criteria

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this Section?

N/A

b. FAA Sec. 531. Is the Assistance to be furnished, to a friendly country, organization, or body eligible to receive assistance?

N/A

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

N/A

PROJECT CHECKLIST

A. 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;

(a) Committees on Appropriation of Senate and House have been notified of the previous Rural Electrification Projects through the Congressional Presentation submitted annually and through special Congressional Notification as in the Rural Electrification IV and the current Rural Electrification V 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%)?

(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

(a) All engineering, financial and other plans for the Rural Electrification Program have been worked out in detail by the NEA with the assistance of NRECA and Stanley Consultants.

(b) a reasonably firm estimate of the cost to the U.S. of the assistance?

(b) As a result of the experience gained from previous Rural Electrification Projects firm cost estimates for commodities to be purchased with FX under this loan are available.

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 is 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 for water or water-related land resource construction.
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?

Mission Director has certified the country's capability to effectively maintain and utilize the project.
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?

The Philippine Rural Electrification Program has been funded by several bilateral assistance programs, the Japanese, French, in addition to AID have provided foreign exchange for purchase of commodities to extend the RE program. The IBRD and ADB, have also expressed interest in funding a portion of the Program and plans are now being finalized for follow on IBRD funding in late 1978 and ADB funding in 1979.
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

(a) Nearly all the AID financed RE loans and other bilateral assistance have finance the FX requirements for purchase of electrical commodities from industrialized countries;

(b) Rural Electrification Program has encouraged the development of private initiative and competition by providing cheap power to numerous small entrepreneurs

and commerce; and (f) strengthen free labor unions.

who would not otherwise be provided power; (c) The Philippine Rural Electrification Program has effectively promoted the development of rural electric cooperatives throughout the country. To date over 82 cooperatives have been established in 72 provinces of the Philippines; (d) By providing cheap electrical power the rural electric program has provided the small entrepreneur a chance to compete in the market place and at least discourage monopolistic practices; (e) Electrical power increases the efficiency of labor and increases small farmer output by providing worker access to tools that increase worker productivity and performance. RE Program has also increase the use of electric water pumps for irrigation and municipal water systems; (f) The Rural Electric Cooperative Program has no effect on free labor unions.

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).

The AID financed assistance to NEA has encouraged U.S. private trade and investment. A large portion of the AID financed electrical commodities have been contracted by private U.S. companies. In addition, a U.S. consulting firm, Stanley Consultants, and the National Rural Electric Cooperative Association have provided technical assistance to the NEA since the beginning of Rural Electrification Program.

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.
- All local currency and some foreign exchange for the project are financed by the GOP. AID financed assistance is strictly limited to foreign exchange for purchase of commodities and to finance consulting firm. The estimated GOP project contribution is \$90 Million during the next three years for local currency and FX.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?
- U.S. owned foreign currency is not now contemplated in the loan project.

B. Funding Criteria For Project

1. Development Assistance Project Criteria

- a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (1) 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 (2) 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?
- a. (1) The poor are participating in the RE program as demonstrated by the social analysis included in this PP. The profile of the poor demonstrates that the needy comprise approximately 40% of project acceptors and are the beneficiaries of a large scale investment program totalling approximately \$250 Million in this decade; (2) The vehicle for this massive RE investment is a national program which by the very nature of the cooperative movement encourages democratic principles.
- 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.
- Rural Electrification is increasing the opportunities of small entrepreneurs to participate in the economy, is increasing the productivity of

If more than one fund source is used for project, include relevant paragraph for each fund source.)

(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.

workers and is providing small farmer access to technology such as electrical driven water pumps, rice mills and other labor saving technology.

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 furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

Host country financial

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?

No.

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

As mentioned on previous occasion the vehicle for implementing the RE Program is the National Rural Electric Cooperative Program. The Cooperative system is a social movement which encourages democratic participation of the masses in their own economic and political development. Electricity provided through the RE Program promotes the self development of the users while meeting the GOP development goals. The

laws; or (b) integrating women into the recipient country's national economy.

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.

cooperative movement promotes the participation of women in the national economy.

The Rural Electrification Program provides economical power to a complete cross section of Filipino Society. The fact that electrical power is received by the common man and is considered by him an important ingredient in his socioeconomic development is dramatized almost weekly when delegation after delegation petitions the NEA for electrical power hook-ups in their community. Electrical power provides the common man with more ready access to the tools necessary for his own development. Rural electrification provides the opportunity for study at night, night classes for adult education, improved medical care as result of better illumination. Electrification also provides cheaper, more convenient power to small entrepreneurs and small farmers which makes them more productive and competitive. Since the Rural Electric Program is organized on the basis of locally owned, managed, independent and financially responsible cooperatives, the movement is a training ground for effective people's participation in the organization administration and control of one of the more important new developments in their lives.

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?

The RE Program will contribute to economic progress, improve productive capacity and promote self sustaining economic growth. RE Program will also stimulate increased utilization of educational, medical and other social service facilities by providing illumination and by providing economical power to run equipment which will improve the quality of social services provided.

The Rural Electrification Program is consistent with other development objectives. For example, in addition to the example treated above paragraph small farmers benefit from economical electric power through the use of electric motor driven water pumps, rice mills which are more efficient and less costly. RE is supportive and consistent with other development activities.

All pertinent economic financial and technical feasibility analysis have been completed and the results of these analyses have been determined to be sound and appropriate for projects of this type.

**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.

This project will have to adverse effect on U. S. economy. Commodities purchased under project are procided under provisions of AID regulations of competitive procurement.

**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.

The NEA has requested assistance from other bilateral and multi-national foreign assistance organizations. Project assistance has been provided by France and Japan in addition to the U.S. Also NEA has requested assistance from the IBRD and ADB for follow on loans for continuation of the Program. The IBRD and ADB have indicated a willingness to fund the RE Program pending project appraisal results.

**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.

(1) An appraisal has been completed of the need for concessional assistance for the RE Program. Repayment prospects are judged to be good. (2) The lending and relending terms under this loan will be the same as previous RE loan assistance projects. These terms have been judged reasonable and legal by qualified representatives from both countries.

- 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?
- The GOP through the NEA has submitted a formal request for loan assistance. Adequate assurances are available which indicate the loan 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?
- Yes
- 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?
- Except for loan financed technical assistance from U.S. consulting firm is 1.5 Million the balance of this loan or 18.5 Million will finance foreign exchange requirement for purchasing electrical commodities from private companies.
- 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?
- AID project assistance will not provide financing for productive enterprises which will compete in the U.S. with U.S. enterprise.
3. Project Criteria Solely for Security Supporting Assistance
- Not applicable
- FAA Sec. 531. How will this assistance support promote economic or political stability?

4. Additional Criteria for Alliance for Progress

Not Applicable

(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?

STANDARD ITEM CHECKLIST

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.
  
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? All commodity procurement financed under this loan will come from AID defined source/origin code 941.
  
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? No marine insurance discrimination has been determined.
  
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? No offshore procurement of agricultural commodities will be financed by this loan.
  
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.
  
6. MMA 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, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

Yes.

8. 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, U. S. consulting firms, NRECA and Stanley Consultants, professional and technical services are used to maximum extent feasible.

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?

All construction contracts are let on competitive basis except where it is determined not practical.

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?

AID assistance is limited to electrical commodities and technical assistance financed with FX.

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? Yes.
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? Yes.
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. 636 (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.
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 (g). to compensate owners for expropriated nationalized property? Yes.
  - c. FAA Sec. 660. 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.

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT  
Manila, Philippines

Ramon Magsaysay Center  
1680 Roxas Boulevard

Telephone: 59-80-11

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

I, CHARLES C. CHRISTIAN, the principal officer of the Agency for International Development in the Philippines, having taken into account, among other things, the maintenance and utilization of the projects in the Philippines previously financed or assisted by the United States, do hereby certify that, in my judgment, the Philippines has both the financial capability and the human resources capability to effectively maintain and utilize the proposed Rural Electrification Loan.



Charles C. Christian  
Acting Director  
USAID/Philippines

5/26/77  
Date

REPUBLIKA NG PILIPINAS  
PAMBANSANG PANGASIWAAN NG ELEKTRIPIKASYON  
(NATIONAL ELECTRIFICATION ADMINISTRATION)  
Lungsod ng Quezon

February 28, 1977

Mr. Peter Cody  
Director  
United States Agency for  
International Development  
Roxas Blvd., Manila

Subject: Request for Loan for Rural Electrification

S i r :

As you know, the USAID has been providing the Government of the Philippines (GOP) much needed financial and technical assistance for the development of a massive, nationwide rural electrification program. Such assistance has resulted in a tremendously successful rural electrification drive which to date has resulted in the establishment of 79 electric cooperatives serving about 500,000 households in even the remote barrios of our country. Such assistance has undoubtedly contributed in no small way to making the Philippine rural electrification program the model for third world countries that it is today. Financial assistance from USAID has come mainly through four soft loans totalling US\$78 Million. This amount can support program requirements until 1978.

It has been agreed upon by the GOP and USAID that the former shall seek financial assistance for program requirements beyond 1978 from international financing institutions other than USAID, particularly the International Bank for Reconstruction and Development (IBRD) and the Asian Development Bank (ADB). Thus on March 31, 1976, Secretary of Finance Cesar Virata sent a letter to the IBRD applying on behalf of GOP a loan of \$25 Million for rural electrification. A similar letter was likewise sent to ADB. We are informed, however, that ADB financing is not forthcoming till about 1980. On the other hand, an IBRD Mission came to the Philippines on November 8, 1976 to undertake preliminary surveys on the Philippine rural electrification program.

Subsequently, sometime in January, 1977, a cable was received by our Office from IBRD indicating that under normal circumstances, loan negotiations will not reach fruition in a loan agreement earlier than May, 1978, which is one year later than initially forecasted, since the electrification loan proposal will not be submitted to the World Bank's loan committee till April, 1978. It follows that materials flow will similarly be delayed. The gap in financial availabilities relative to requirements is estimated at US\$10 - 20 Million.

Mr. Peter Cody  
Director  
USAID

- 2 -

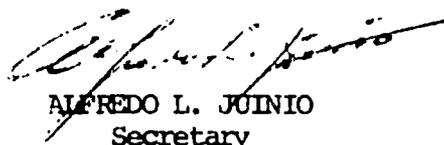
February 23, 1977

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Because of the foregoing, we wish to request USAID for a "stop-gap" loan in the amount of US\$20 Million. Such funding would be extremely useful so as not to impair the smooth pace of program implementation.

We hope for your special consideration of this request.

Very truly yours,



ALFREDO L. JOINIO  
Secretary  
Department of Public Works,  
Transportation & Communications  
& Chairman, Board of Administrators, NEA

**SUMMARY COST ESTIMATE AND FINANCIAL PLAN**  
( US \$ 000 )

Source	AID		Host Country		Total
	FX	LC	FX	LC	
Use					
1. Consulting/ Engineering Service	<u>1/</u>			2,000	2,000
2. Training				<u>2/</u>	
3. Electrical Materials	20,000		1,000	7,000	28,000
4. Administration				<u>3/</u>	
5. Construction				10,000	10,000
<b>Total</b>	<b>20,000</b>		<b>1,000</b>	<b>19,000</b>	<b>40,000</b>

**COSTING OF PROJECT OUTPUTS/INPUTS**  
( In \$000 or equivalent)

Project Inputs	Project Outputs Cooperatives <u>4/</u>	Total
AID Appropriated		
Electrical Materials	20,000	20,000
Host Country		
Electrical Materials	8,000	8,000
Engineering Service	2,000	2,000
Construction Service	10,000	10,000
<b>Total</b>	<b>40,000</b>	<b>40,000</b>

1/ Provided for under Loan # 492-T-043

2/ GOP counterpart under Loan # 492-T-043

3/ Funded from NEA capitalization

4/ The program output is a viable cooperative in every province (except small island subprovinces) by 1977. This project builds on this output goal by providing resources to construct additional "backbone" and distribution lines and make 200,000 service connections.

**DRAFT PAF**  
Part I

ANNEX J  
Page 1

AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT AUTHORIZATION AND REQUEST                  FOR ALLOTMENT OF FUNDS PART I</b>				1. TRANSACTION CODE <input type="checkbox"/> A    ADD <input type="checkbox"/> C    CHANGE <input type="checkbox"/> D    DELETE		PAF 2. DOCUMENT CODE 5			
3. COUNTRY/ENTITY Philippines				4. DOCUMENT REVISION NUMBER <input type="checkbox"/>					
5. PROJECT NUMBER (7 digits) [492-0321]		6. BUREAU/OFFICE A. SYMBOL    B. CODE ASIA        [04]		7. PROJECT TITLE (Maximum 40 characters) [ Rural Electrification V ]					
8. PROJECT APPROVAL DECISION ACTION TAKEN <input type="checkbox"/> A    APPROVED <input type="checkbox"/> D    DISAPPROVED <input type="checkbox"/> DE    DEAUTHORIZED				9. ESTIMATED PERIOD OF IMPLEMENTATION YRS. [03]    QTRS. [0]					
10. APPROVED BUDGET AID APPROPRIATION						TECH. FUNDS (\$000)			
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE				E. 1ST FY.	H. 2ND FY.	K. 3RD FY.	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	B 201		062		8,400				
(2)									
(3)									
(4)									
TOTALS						8,400			
A. APPROPRIATION	N. 4TH FY.		O. 5TH FY.		LIFE OF PROJECT		11. PROJECT FUNDING AUTHORIZED	A. GRANT	B. LOAN
	Q. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	ENTER APPROPRIATE CODE(S) 1. LIFE OF PROJECT 2. INCREMENTAL LIFE OF PROJECT		
(1)						8,400			1
(2)									
(3)									
(4)									
TOTALS						8,400			80
12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)						13. FUNDS RESERVED FOR ALLOTMENT			
A. APPROPRIATION	B. ALLOTMENT REQUEST NO. _____					TYPED NAME (Chief, SRR/PM/PSD)			
	C. GRANT	D. LOAN				SIGNATURE _____			
(1) FN	8,400				DATE _____				
(2)									
(3)									
(4)									
TOTALS						8,400			
14. SOURCE/ORIGIN OF GOODS AND SERVICES						<input type="checkbox"/> 000 <input checked="" type="checkbox"/> 941 <input type="checkbox"/> LOCAL <input type="checkbox"/> OTHER _____			
15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED									

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE			18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE		
		MM	DD	YY		MM	DD	YY

AID 1980-8 (7-76)

**USAID-AD/CD**  
5-27-77

- D R A F T -

**Project Authorization and Request for Allotment of Funds**

**PART II**

**Philippines**

**Rural Electrification V**

**492 - 0321**

**Loan 492-T**

Pursuant to Part I, Chapter I, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a loan to Government of the Philippines the "Cooperating Country" through the National Economic and Development Authority "Borrower" for the National Electrification Administration "Beneficiary" of not to exceed Eight Million Four Hundred Thousand United States Dollars (\$8,400,000), the ("Authorized Amount") to help in financing certain foreign exchange costs of goods required for the project as described in the following paragraph.

The project consists of the continuation of technical assistance and commodity inputs financed under previous A.I.D. Rural Electrification Loans to assist with the introduction of electricity into all barrios in the Philippines by 1984 and totally electrify the countryside by 1990. A.I.D. financing will assist the cooperating country achieve the two initial targets of the program - establish a rural electric cooperative in every province by the end of this year and complete a backbone system linking all municipalities in the coop system. The proceeds of this loan will be used to: a) permit the beneficiary to

finance the foreign exchange costs of certain required engineering and other professional services and; b) permit the Beneficiary to finance the foreign exchange costs of project related commodities required by the Beneficiary and/or rural electric cooperatives. 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 of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulation and Delegations of Authority subject to the following essential terms and covenants and major conditions; together with such other terms and conditions as A.I.D. may deem appropriate:

a) Interest Rate and Terms of Repayment

The Cooperative Country shall repay the Loan to A.I.D. in United States Dollars within twenty (20) 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 (b) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the loan and on any due and unpaid interest accrued thereon;

b) Source and Origin of Goods and Services

Goods and services financed by A. I. D. under the project shall have their source and origin in countries included in A. I. D. Geographic Code 941 except as A. I. D. may otherwise agree in writing. A. I. D. has also determined that raw materials when utilized as component costs of commodities to be manufactured in the Philippines by local manufacturers are also eligible for loan financing under this loan where such components are imported specifically for the project and raw materials have their source and origin in A. I. D. Code 941 countries. Funds under this loan cannot be used for domestic processing costs.

c) The Borrower shall covenant that the Borrower will make the loan proceeds available to NEA on same terms and conditions as the last Rural Electrification Loan (492-T-043) provided by A. I. D.

available to NEA on terms and conditions satisfactory to A. I. D.;

d) Borrower shall covenant that the Borrower will make available to NEA on a timely basis peso funds required for the implementation of the project;

e) Borrower shall covenant that the Borrower absorb any maintenance of value risks on behalf of NEA and the cooperatives;

f) Borrower shall covenant that NEA will implement the evaluation plan so outlined in the PP paper and accepted by A. I. D. ;

g) Borrower shall covenant that an environmental assessment be conducted by Inter-agency Committee for Ecological Studies (ICES) of the Rural Electrification Program with the results and recommendations of such assessment incorporated into the project implementation plan.

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Signature

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Date

Table 1.-

ENERGY DEMAND FORECAST

Residential: Poblaciones <sup>1/</sup>					
<u>Year</u>	<u>Total<sup>2/</sup> Connections/ Year</u>	<u>KWH/ Conn/ Year<sup>3/</sup></u>	<u>revenue/ Conn/ Year (Pesos)</u>	<u>Revenue/ Conn/ Year (Dollars)<sup>4/</sup></u>	<u>Total Annual Revenues (Dollars)<sup>5/</sup></u>
1	-----	---	---	-----	-----
2	5,042	588	₱ 212	\$ 28	\$ .141
3	12,604	612	220	29	.366
4	21,428	648	233	31	.664
5	29,621	684	246	33	.977
6	37,815	720	259	35	1.324
7	46,007	756	272	36	1.656
8	52,310	792	285	38	1.988
9	57,982	828	298	40	2.319
10	63,024	864	311	41	2.584
11	63,024	912	328	44	2.773
12	63,024	960	346	46	2.899
13	63,024	1,008	363	48	3.025
14	63,024	1,056	380	51	3.214
15	63,024	1,104	397	53	3.340
16	63,024	1,164	419	56	3.529
17	63,024	1,224	441	59	3.718
18	63,024	1,284	462	62	3.907
19	63,024	1,344	484	65	4.097
20	63,024	1,416	510	68	4.286
21	63,024	1,488	536	71	4.475
22	63,024	1,560	562	75	4.740
23	63,024	1,644	592	79	4.979
24	63,024	1,704	613	82	5.168
25	63,024	1,788	644	86	5.420
					<u>\$ 71.589</u>

<sup>1/</sup>Thirty-two percent of population lives in Poblaciones.

<sup>2/</sup>We have assumed no additional connections after year 10.

<sup>3/</sup>Energy demand increases on an average by 4 percent per year.

<sup>4/</sup>US \$1.00 = ₱ 7.5

<sup>5/</sup>Dollars thousand

ENERGY DEMAND FORECASTResidential: Main Road Barrios<sup>1/</sup>

<u>Year</u>	<u>Total<sup>2/</sup> Connect- ions/ Year</u>	<u>KWH/ Conn/ Year<sup>3/</sup></u>	<u>Revenue Conn/ Year (Pesos)</u>	<u>Revenue Conn/ Year (Dollars)<sup>4/</sup></u>	<u>Total Annual Revenues (Dollars)<sup>5/</sup></u>
1	-----	---	---	-----	-----
2	5,357	504	₱ 181	\$ 24	\$ .129
3	13,393	552	199	27	.362
4	22,768	576	207	28	.638
5	31,473	600	216	29	.913
6	40,178	624	225	30	1.205
7	48,884	648	233	31	1.515
8	55,580	672	242	32	1.779
9	61,607	696	251	33	2.033
10	66,964	720	259	35	2.344
11	66,964	744	268	36	2.411
12	66,964	768	277	37	2.478
13	66,964	804	289	39	2.612
14	66,964	840	302	40	2.679
15	66,964	876	315	42	2.812
16	66,964	912	328	44	2.946
17	66,964	948	341	45	3.013
18	66,964	984	354	47	3.147
19	66,964	1,020	367	49	3.281
20	66,964	1,056	380	51	3.415
21	66,964	1,104	397	53	3.549
22	66,964	1,152	415	55	3.683
23	66,964	1,200	432	58	3.884
24	66,964	1,248	449	60	4.018
25	66,964	1,296	467	62	<u>4.152</u>
					\$ 58.998

<sup>1/</sup> Thirty-four percent of population lives in Main Road Barrios.

<sup>2/</sup> We have assumed no additional connections after year 10.

<sup>3/</sup> Energy demand increases on an average by 4 percent per year.

<sup>4/</sup> US \$1.00 = ₱ 7.5

<sup>5/</sup> Dollars thousand

Table 3.-

- 8 -  
ENERGY DEMAND FORECAST

ANNEX K

Page 3

Residential: Interior Barrios<sup>1/</sup>

Year	Total <sup>2/</sup> Connect- ions/ Year	KWH/ Conn/ Year <sup>3/</sup>	Revenue/ Conn/ Year (Pesos)	Revenue/ Conn/ Year (Dollars, <sup>4/</sup>	Total Annual Revenues (Dollars) <sup>5/</sup>
1	-----	-----	-----	-----	-----
2	5,357	444	₱ 160	\$ 21	\$ .112
3	13,393	456	164	22	.295
4	22,768	480	173	23	.524
5	31,473	504	181	24	.755
6	40,178	528	190	25	1.004
7	48,884	55-	199	27	1.320
8	55,580	576	207	28	1.556
9	61,607	600	216	29	1.787
10	66,964	624	225	30	2.009
11	66,964	648	233	31	2.076
12	66,964	672	242	32	2.143
13	66,964	696	251	33	2.210
14	66,964	720	259	35	2.344
15	66,964	744	268	36	2.411
16	66,964	768	277	37	2.478
17	66,964	804	289	39	2.612
18	66,964	840	302	40	2.679
19	66,964	876	315	42	2.812
20	66,964	912	328	44	2.946
21	66,964	948	341	45	3.013
22	66,964	984	354	47	3.147
23	66,964	1,020	367	49	3.281
24	66,964	1,056	380	51	3.415
25	66,964	1,104	397	53	3.549
					\$ 50.478

<sup>1/</sup> Thirty-four percent of the population live in Interior Barrios.

<sup>2/</sup> We have assumed no additional connections after year 10.

<sup>3/</sup> Energy demand increases on an average by 4 percent per year.

<sup>4/</sup> US \$1.00 = ₱ 7.5

<sup>5/</sup> Dollars thousand

Table 4.-

- 9 -  
ENERGY DEMAND FORECAST

ANNEX K

Page 4

Commercial

<u>Year</u>	<u>Total Connect- ions/ Year</u>	<u>KWH/ Conn/ Year<sup>1/</sup></u>	<u>Revenue/ Conn/ Year (Pesos)</u>	<u>Revenue/ Conn/ Year (Dollars)<sup>2/</sup></u>	<u>Total Annual Revenues (Dollars)<sup>3/</sup></u>
1	-----	-----	-----	-----	-----
2	2,139	1,308	P 471	\$ 63	\$ .135
3	5,347	1,356	488	65	.348
4	9,091	1,416	510	68	.618
5	12,566	1,476	531	71	.892
6	16,042	1,536	553	74	1.187
7	19,518	1,596	575	77	1,503
8	22,192	1,656	596	79	1.753
9	24,598	1,728	622	83	2.042
10	26,737	1,800	648	86	2.299
11	26,737	1,872	674	90	2.406
12	26,737	1,944	700	93	2.487
13	26,737	2,016	726	97	2.593
14	26,737	2,100	756	101	2.700
15	26,737	2,184	786	105	2.807
16	26,737	2,268	816	109	2.914
17	26,737	2,364	851	113	3.021
18	26,737	2,460	886	118	3.155
19	26,737	2,556	920	123	3.289
20	26,737	2,664	959	128	3.422
21	26,737	2,772	998	133	3.556
22	26,737	2,880	1,037	138	3.690
23	26,737	3,000	1,080	144	3.850
24	26,737	3,120	1,123	150	4.011
25	26,737	3,240	1,166	155	4.144
					\$ 58.822

<sup>1/</sup> Energy demand increases on an average by 4 percent per year.

<sup>2/</sup> US \$1.00 = P 7.5

<sup>3/</sup> Dollars thousand.

Table 5.-

- 10 -

ENERGY DEMAND FORECAST

ANNEX K

Page 5

Industrial					
<u>Year</u>	<u>Total<sup>1/</sup> Connections/ Year</u>	<u>KWH/ Conn/ Year<sup>2/</sup></u>	<u>Revenue/ Conn/ Year (Pesos)</u>	<u>revenue/ Conn/ Year (Dollars)<sup>3/</sup></u>	<u>Total Annual Revenues (Dollars)<sup>5/</sup></u>
1	-----	-----	-----	-----	-----
2	5	4,200	P 1,512	\$ 202	\$ .001
3	9	4,368	1,572	210	.002
4	14	4,548	1,637	218	.003
5	14	4,728	1,702	227	.003
6	14	4,920	1,771	236	.003
7	14	5,112	1,840	245	.003
8	14	5,316	1,914	255	.004
9	14	5,532	1,993	266	.004
10	14	5,748	2,069	276	.004
11	14	5,976	2,151	287	.004
12	14	6,216	2,238	298	.004
13	14	6,468	2,328	310	.004
14	14	6,732	2,424	323	.005
15	14	6,996	2,519	336	.005
16	14	7,272	2,618	349	.005
17	14	7,536	2,713	362	.005
18	14	7,836	2,821	376	.005
19	14	8,148	2,933	391	.005
20	14	8,472	3,050	407	.006
21	14	8,808	3,171	423	.006
22	14	9,156	3,296	439	.006
23	14	9,528	3,430	457	.006
24	14	9,912	3,568	476	.007
25	14	10,308	3,711	495	.007
					<u>\$ .107</u>

<sup>1/</sup>We have assumed no additional connections after year 4.

<sup>2/</sup>Energy demand increases on an average by 4 percent per year.

<sup>3/</sup>US \$1.00 = P 7.5

<sup>4/</sup>Dollars thousand

Table 6.-

- 11 -  
ENERGY DEMAND FORECAST

ANNEX K

Page 6

Public Buildings					
Year	Total <sup>1/</sup> Connect- ions/ Year	KWH/ Conn/ Year <sup>2/</sup>	Revenue/ Conn/ Year (Pesos)	Revenue/ Conn/ Year (Dollars) <sup>3/</sup>	Total Annual Revenues (Dollars) <sup>4/</sup>
1	-----	-----	-----	-----	-----
2	78	360	P 130	\$ 17	\$ .001
3	193	360	130	17	.003
4	327	360	130	17	.006
5	327	360	130	17	.006
6	327	360	130	17	.006
7	327	360	130	17	.006
8	327	360	130	17	.006
9	327	360	130	17	.006
10	327	360	130	17	.006
11	327	360	130	17	.006
12	327	360	130	17	.006
13	327	360	130	17	.006
14	327	360	130	17	.006
15	327	360	130	17	.006
16	327	360	130	17	.006
17	327	360	130	17	.006
18	327	360	130	17	.006
19	327	360	130	17	.006
20	327	360	130	17	.006
21	327	360	130	17	.006
22	327	360	130	17	.006
23	327	360	130	17	.006
24	327	360	130	17	.006
25	327	360	130	17	.006
					\$ .136

<sup>1/</sup> We have assumed no additional connections after year 4.

<sup>2/</sup> Energy demand per connection remains constant throughout life of project.

<sup>3/</sup> US \$1.00 = P 7.5

<sup>4/</sup> Dollars thousand.

Table 7.-

ENERGY DEMAND FORECAST

Street Lights					
Year	Street Lights <sup>1/</sup>	KWH/ Street Light Year	Revenue/ Street Light/ Year (pesos)	revenue/ Street Light/ Year (Dollars) <sup>2/</sup>	Total Annual Revenues (Dollars) <sup>3/</sup>
1	-----	-----	-----	-----	-----
2	1,858	756	₱ 272	\$ 36	\$ .067
3	4,512	756	272	36	.162
4	7,608	756	272	36	.274
5	8,139	756	272	36	.293
6	8,582	756	272	36	.309
7	8,670	756	272	36	.312
8	8,714	756	272	36	.314
9	8,759	756	272	36	.315
10	8,847	756	272	36	.318
11	8,847	756	272	36	.318
12	8,847	756	272	36	.318
13	8,847	756	272	36	.318
14	8,847	756	272	36	.318
15	8,847	756	272	36	.318
16	8,847	756	272	36	.318
17	8,847	756	272	36	.318
18	8,847	756	272	36	.318
19	8,847	756	272	36	.318
20	8,847	756	272	36	.318
21	8,847	756	272	36	.318
22	8,847	756	272	36	.318
23	8,847	756	272	36	.318
24	8,847	756	272	36	.318
25	8,847	756	272	36	.318
					<u>\$ 7.134</u>

<sup>1/</sup>We have assumed that no additional street lights are installed after year 10.

<sup>2/</sup>US \$1.00 = ₱ 7.5

<sup>3/</sup>Dollars thousand

Table 9.-

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BENEFITS

Direct: Revenues						(Dollars thousand)
<u>Year</u>	<u>resi- dential</u>	<u>Com- mercial</u>	<u>Indus- trial</u>	<u>Public Bldgs.</u>	<u>Street Lights</u>	<u>Total</u>
1	-----	-----	-----	-----	-----	-----
2	.382	.135	.001	.001	.067	\$ .586
3	1.023	.348	.002	.003	.162	1.538
4	1.826	.618	.003	.006	.274	2.727
5	2.645	.892	.003	.006	.293	3.839
6	3.533	1.187	.003	.006	.309	5.038
7	4.491	1.503	.003	.006	.312	6.315
8	5.323	1.753	.004	.006	.314	7.400
9	6.139	2.042	.004	.006	.315	8.506
10	6.937	2.299	.004	.006	.318	9.564
11	7.260	2.406	.004	.006	.318	9.994
12	7.520	2.487	.004	.006	.318	10.335
13	7.847	2.593	.004	.006	.318	10.768
14	8.237	2.700	.005	.006	.318	11.266
15	8.563	2.807	.005	.006	.318	11.699
16	8.953	2.914	.005	.006	.318	12.196
17	9.343	3.021	.005	.006	.318	12.693
18	9.733	3.155	.005	.006	.318	13.217
19	10.190	3.289	.005	.006	.318	13.808
20	10.647	3.422	.006	.006	.318	14.399
21	11.037	3.556	.006	.006	.318	14.923
22	11.570	3.690	.006	.006	.318	15.590
23	12.144	3.850	.006	.006	.318	16.324
24	12.601	4.011	.007	.006	.318	16.943
25	<u>13.121</u>	<u>4.144</u>	<u>.007</u>	<u>.006</u>	<u>.318</u>	<u>17.596</u>
TOTAL	181.065	58.822	.107	.136	7.134	247.264

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Table 10.-

BENEFITS

Indirect: Lighting <sup>1/</sup>					
(Dollars thousand)					
<u>Year</u>	<u>Poblacion</u>	<u>Main Road Barrio</u>	<u>Interior Barrio</u>	<u>Commercial</u>	<u>Total</u>
1	-----	-----	-----	-----	-----
2	.045	.037	.043	.029	.154
3	.113	.093	.107	.072	.385
4	.193	.159	.182	.122	.656
5	.267	.220	.252	.168	.907
6	.340	.281	.321	.213	1.159
7	.414	.342	.391	.258	1.405
8	.523	.389	.445	.293	1.654
9	.580	.431	.493	.324	1.828
10	.630	.469	.536	.352	1.987
11	.630	.469	.536	.352	1.987
12	.630	.469	.536	.352	1.987
13	.630	.469	.536	.352	1.987
14	.630	.469	.536	.352	1.987
15	.693	.536	.603	.352	2.184
16	.693	.536	.603	.352	2.184
17	.693	.536	.603	.352	2.184
18	.693	.536	.603	.352	2.184
19	.693	.536	.603	.352	2.184
20	.693	.536	.603	.352	2.184
21	.693	.536	.603	.352	2.184
22	.693	.536	.603	.352	2.184
23	.756	.536	.603	.352	2.184
24	.756	.536	.603	.352	2.247
25	.756	.536	.603	.352	2.247
	<u>13.437</u>	<u>10.193</u>	<u>11.547</u>	<u>7.111</u>	<u>42.288</u>

<sup>1/</sup> The cost saved by not using kerosene for lighting.

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Table 11.-

BENEFITS

<u>Year</u>	<u>Indirect: Appliances<sup>1/</sup> and Income<sup>2/</sup></u> (Dollars thousand)				<u>Total</u>
	<u>Poblacion</u>	<u>Main Road Barrio</u>	<u>Interior Barrio</u> <sup>3/</sup>	<u>Commercial</u>	
1	-----	-----	-----	-----	-----
2	.001	0	0	.015	.016
3	.005	.002	0	.036	.043
4	.009	.003	0	.061	.073
5	.013	.007	0	.084	.104
6	.017	.010	0	.113	.140
7	.021	.015	0	.129	.165
8	.030	.019	0	.147	.196
9	.035	.025	0	.162	.222
10	.041	.028	0	.176	.245
11	.044	.030	0	.180	.254
12	.047	.032	0	.181	.260
13	.050	.032	0	.183	.265
14	.054	.033	0	.183	.270
15	.059	.034	0	.184	.277
16	.061	.035	0	.184	.280
17	.062	.037	0	.184	.283
18	.065	.037	0	.185	.287
19	.068	.038	0	.185	.291
20	.071	.039	0	.186	.296
21	.074	.039	0	.186	.299
22	.078	.039	0	.186	.303
23	.083	.040	0	.186	.309
24	.086	.040	0	.187	.313
25	.090	.040	0	.187	.317
	<u>1.164</u>	<u>.654</u>	<u>0</u>	<u>3.690</u>	<u>5.508</u>

<sup>1/</sup> The cost saved by not using more expensive sources of energy for running household appliances such as battery operated television sets and kerosene run refrigerators.

<sup>2/</sup> Increased income accruing to commercial consumers as a result of the sale of refrigerated products.

<sup>3/</sup> Ownership of appliances too small to be significant.

## BENEFIT-COST RATIO, NET PRESENT WORTH, INTERNAL ECONOMIC RATE OF RETURN

(Million United States Dollars)

Year	Investment Costs	O & M Costs	Power Costs	Total Costs	Direct Benefits	Indirect Benefits	Total Benefits	Cash Flow	P. W. Cash Flow at 15%	P. W. Cash Flow at 30%	P. W. Costs at 15%	P. W. Benefits at 15%
1	3.080	.092	0	3.172	0	0	0	- 3.172	- 2.760	- 2.439	2.760	0
2	2.200	.158	.352	2.710	.586	.170	.756	- 1.954	- 1.477	- 1.157	2.049	.572
3	2.860	.244	.923	4.027	1.538	.428	1.966	- 2.061	- 1.356	- .938	2.650	1.294
4	1.870	.300	1.636	3.806	2.727	.729	3.456	- .350	- .200	- .123	2.177	1.977
5	.990	.330	2.303	3.623	3.839	1.011	4.850	+ 1.227	+ .610	+ .330	1.801	2.410
6	0	.330	3.023	3.353	5.038	1.295	6.333	+ 2.980	+ 1.287	+ .617	1.448	2.736
7	0	.330	3.789	4.119	6.315	1.570	7.885	+ 3.766	+ 1.416	+ .599	1.549	2.953
8	0	.330	4.440	4.770	7.400	1.846	9.246	+ 4.476	+ 1.464	+ .551	1.560	3.023
9	0	.330	5.104	5.434	8.506	2.050	10.556	+ 5.122	+ 1.455	+ .481	1.543	2.998
10	0	.330	5.738	6.068	9.564	2.232	11.796	+ 5.728	+ 1.415	+ .418	1.499	2.914
11	0	.330	5.996	6.326	9.994	2.243	12.237	+ 5.911	+ 1.271	+ .331	1.360	2.631
12	0	.330	6.201	6.531	10.335	2.245	12.580	+ 6.049	+ 1.131	+ .260	1.222	2.352
13	0	.330	6.461	6.791	10.768	2.252	13.020	+ 6.229	+ 1.015	+ .206	1.107	2.122
14	0	.330	6.760	7.090	11.266	2.257	13.523	+ 6.433	+ .907	+ .161	1.000	1.907
15	0	.330	7.019	7.349	11.699	2.461	14.160	+ 6.811	+ .838	+ .136	.904	1.742
16	0	.330	7.316	7.646	12.196	2.464	14.660	+ 7.014	+ .750	+ .105	.818	1.569
17	0	.330	7.616	7.946	12.693	2.467	15.160	+ 7.214	+ .671	+ .087	.739	1.410
18	0	.330	7.930	8.260	13.217	2.471	15.688	+ 7.428	+ .602	+ .067	.669	1.271
19	0	.330	8.285	8.615	13.808	2.475	16.283	+ 7.668	+ .537	+ .054	.603	1.140
20	0	.330	8.639	8.969	14.399	2.480	16.879	+ 7.910	+ .483	+ .040	.547	1.030
21	0	.330	8.954	9.284	14.923	2.483	17.406	+ 8.122	+ .430	+ .032	.492	.923
22	0	.330	9.354	9.684	15.590	2.487	18.077	+ 8.393	+ .386	+ .025	.445	.832
23	0	.330	9.794	10.124	16.324	2.556	18.880	+ 8.756	+ .350	+ .018	.405	.755
24	0	.330	10.166	10.496	16.943	2.560	19.503	+ 9.007	+ .315	+ .018	.367	.683
25	0	.330	10.558	10.888	17.596	2.564	20.160	+ 9.272	+ .278	+ .009	.327	.605
	11.000	7.724	148.357	167.081	247.264	47.796	295.060	+ 127.979	+ 11.818	- .112	30.031	41.849

Benefit-cost Ratio at 15% is 1.4

Internal economic rate of return is 30%

Net Present Worth is \$11.818

Table 13.-

Project Sensitivity Analysis

Most Probable Outcome						
Year	Total Costs	Total Benefits	Incremental Benefit		P. W. at 15%	P. W. at 30%
1	3.172	0	-	3.172	- 2.760	- 2.439
2	2.710	.756	-	1.954	- 1.477	- 1.157
3	4.027	1.966	-	2.601	- 1.356	- .938
4	3.806	3.456	-	.350	- .200	- .123
5	3.623	4.850	+	1.227	+ .610	+ .330
6	3.353	6.333	+	2.980	+ 1.287	+ .617
7	4.119	7.885	+	3.766	+ 1.416	+ .599
8	4.770	9.246	+	4.476	+ 1.464	+ .551
9	5.434	10.556	+	5.122	+ 1.455	+ .481
10	6.068	11.796	+	5.728	+ 1.415	+ .418
11	6.326	12.237	+	5.911	+ 1.272	+ .331
12	6.531	12.580	+	6.049	+ 1.131	+ .260
13	6.791	13.020	+	6.229	+ 1.015	+ .206
14	7.090	13.523	+	6.433	+ .907	+ .161
15	7.349	14.160	+	6.811	+ .838	+ .136
16	7.646	14.660	+	7.014	+ .750	+ .105
17	7.946	15.160	+	7.214	+ .671	+ .087
18	8.260	15.688	+	7.428	+ .602	+ .067
19	8.615	16.283	+	7.668	+ .537	+ .054
20	8.969	16.879	+	7.910	+ .483	+ .040
21	9.284	17.406	+	8.122	+ .430	+ .032
22	9.684	18.077	+	8.393	+ .386	+ .025
23	10.124	18.880	+	8.756	+ .350	+ .018
24	10.496	19.503	+	9.007	+ .315	+ .018
25	10.888	20.160	+	9.272	+ .278	+ .009
Total	167.081	295.060	+	127.979	+ 11.818	- .112

The internal economic rate of return is 30%.

Table 14.-

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Project Sensitivity Analysis

Assuming a 25 percent Cost Overrun

<u>Year</u>	<u>Total Costs</u>	<u>Total Benefits</u>	<u>Incremental Benefit</u>	<u>P. W. at 15%</u>	<u>P. W. at 20%</u>
1	3.965	-----	- 3.965	- 3.442	- 3.303
2	3.387	.756	- 2.631	- 1.989	- 1.826
3	5.033	1.966	- 3.067	- 2.018	- 1.776
4	4.757	3.456	- 1.301	- .744	- .627
5	4.529	4.850	+ .321	+ .160	+ .129
6	4.191	6.333	+ 2.142	+ .925	+ .718
7	5.149	7.885	+ 2.736	+ 1.029	+ .763
8	5.963	9.246	+ 3.283	+ 1.074	+ .765
9	6.793	10.556	+ 3.763	+ 1.069	+ .730
10	7.585	11.796	+ 4.211	+ 1.040	+ .682
11	7.908	12.237	+ 4.329	+ .931	+ .584
12	8.164	12.580	+ 4.416	+ .826	+ .495
13	8.489	13.020	+ 4.531	+ .739	+ .421
14	8.863	13.523	+ 4.660	+ .657,	+ .363
15	9.187	14.160	+ 4.973	+ .612	+ .323
16	9.558	14.660	+ 5.012	+ .546	+ .276
17	9.933	15.160	+ 5.227	+ .486	+ .235
18	10.325	15.688	+ 5.363	+ .434	+ .204
19	10.769	16.283	+ 5.514	+ .386	+ .171
20	11.211	16.879	+ 5.668	+ .346	+ .147
21	11.605	17.406	+ 5.801	+ .307	+ .128
22	12.105	18.077	+ 5.972	+ .275	+ .107
23	12.655	18.880	+ 6.225	+ .249	+ .093
24	13.120	19.503	+ 6.383	+ .223	+ .084
25	13.160	20.160	+ 6.550	+ .197	+ .066
	<u>208.854</u>	<u>295.060</u>	<u>+ 86.116</u>	<u>+ 4.318</u>	<u>- .048</u>

The internal economic rate of return is 20%.

Table 15.-

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Project Sensitivity Analysis

Assuming a 25 percent Decrease in Benefits

<u>Year</u>	<u>Total Costs</u>	<u>Total Benefits</u>	<u>Incremental Benefit</u>	<u>P. W. at 15%</u>	<u>P. W. at 20%</u>
1	3.172	-----	- 3.172	- 2.760	- 2.642
2	2.710	.567	- 2.143	- 1.620	- 1.487
3	4.027	1.475	- 2.552	- 1.679	- 1.478
4	3.806	2.592	- 1.214	- .694	- .585
5	3.623	3.638	+ .015	+ .007	+ .006
6	3.353	4.750	+ 1.397	+ .604	+ .468
7	4.119	5.914	+ 1.795	+ .675	+ .501
8	4.770	6.935	+ 2.165	+ .708	+ .504
9	5.434	7.917	+ 2.483	+ .705	+ .482
10	6.068	8.847	+ 2.779	+ .686	+ .450
11	6.326	9.178	+ 2.852	+ .613	+ .385
12	6.531	9.435	+ 2.904	+ .543	+ .325
13	6.791	9.765	+ 2.974	+ .485	+ .277
14	7.090	10.142	+ 3.052	+ .430	+ .238
15	7.349	10.620	+ 3.271	+ .402	+ .213
16	7.646	10.995	+ 3.349	+ .358	+ .181
17	7.946	11.370	+ 3.424	+ .318	+ .154
18	8.260	11.766	+ 3.506	+ .284	+ .133
19	8.615	12.212	+ 3.597	+ .252	+ .112
20	8.969	12.659	+ 3.690	+ .225	+ .096
21	9.284	13.055	+ 3.771	+ .200	+ .083
22	9.684	13.558	+ 3.874	+ .178	+ .070
23	10.124	14.160	+ 4.036	+ .161	+ .061
24	10.496	14.627	+ 4.131	+ .145	+ .054
	167.081	221.297	+ 54.216	+ 1.353	- 1.357

The internal economic rate of return is 17%.

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OUTGOING  
TELEGRAM

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INFO OCT-01 EA-12 EB-88 IGA-02 L-03 /085 R

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ASIA/PD:MMPEHL  
ASIA/PT:VLELLIOTT (PHONE)  
ASIA/DP:RROAN (PHONE)

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E.O. 11652: N/A

TAGS:

SUBJECT: PHILIPPINES RURAL ELECTRIFICATION V  
PROJECT NO. 492-0321

REF: (A) WENDEL/DANGLER TELCON DATED 12/7/77; (B) DANGLER/  
WENDEL TELECON DATED 12/6/77; (C) MANILA 18911

PER REFTEL C REQUEST AND AS DISCUSSED IN REFS A AND B, TEXT  
OF RE V LOAN AUTHORIZATION SUBMITTED AS FOLLOWS:

(A) PURSUANT TO PART 1, CHAPTER 1, SECTION 103 OF THE  
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED, I HEREBY  
AUTHORIZE A LOAN TO THE GOVERNMENT OF THE REPUBLIC OF THE  
PHILIPPINES (THE QUOTE COOPERATING COUNTRY UNQUOTE) ACTING  
THROUGH THE NATIONAL ECONOMIC AND DEVELOPMENT AUTHORITY FOR  
THE NATIONAL ELECTRIFICATION ADMINISTRATION (THE QUOTE  
BENEFICIARY UNQUOTE) OF NOT TO EXCEED EIGHT MILLION FOUR  
HUNDRED THOUSAND UNITED STATES DOLLARS (DOLS 8,400,000),  
(THE QUOTE AUTHORIZED AMOUNT UNQUOTE) TO HELP IN FINANCING  
CERTAIN FOREIGN EXCHANGE COSTS OF GOODS AND SERVICES  
REQUIRED FOR THE PROJECT AS DESCRIBED IN THE FOLLOWING  
PARAGRAPH.

(B) THE PROJECT CONSISTS OF THE CONTINUATION OF CERTAIN  
COMMODITY INPUTS TO ASSIST WITH THE INTRODUCTION OF

ELECTRICITY INTO ALL BARRIOS IN THE PHILIPPINES BY 1984  
WITH THE ULTIMATE PURPOSE OF TOTAL ELECTRIFICATION OF THE  
COUNTRYSIDE BY 1990. A.I.D. FINANCING WILL ASSIST THE  
COOPERATING COUNTRY TO ACHIEVE THE TWO INITIAL TARGETS OF  
THE PROGRAM - TO ESTABLISH A RURAL ELECTRIC COOPERATIVE IN  
EVERY PROVINCE BY THE END OF THIS YEAR AND TO COMPLETE A  
BACKBONE SYSTEM LINKING ALL MUNICIPALITIES IN THE COOPERA-  
TIVE SYSTEM. THE PROCEEDS OF THIS LOAN WILL BE USED TO  
PERMIT THE BENEFICIARY TO FINANCE THE FOREIGN EXCHANGE  
COSTS OF PROJECT RELATED COMMODITIES REQUIRED BY THE  
BENEFICIARY AND/OR RURAL ELECTRIC COOPERATIVES. THE EN-  
TIRE AMOUNT OF THE A.I.D. FINANCING HEREIN AUTHORIZED FOR  
THE PROJECT WILL BE OBLIGATED WHEN THE PROJECT AGREEMENT  
IS EXECUTED.

(C) I HEREBY AUTHORIZE THE INITIATION OF NEGOTIATION AND  
EXECUTION OF THE PROJECT AGREEMENT BY THE OFFICER TO WHOM  
SUCH AUTHORITY HAS BEEN DELEGATED IN ACCORDANCE WITH A.I.D.  
REGULATION AND DELEGATIONS OF AUTHORITY SUBJECT TO THE  
FOLLOWING ESSENTIAL TERMS AND COVENANTS AND MAJOR CONDI-  
TIONS, TOGETHER WITH SUCH OTHER TERMS AND CONDITIONS AS  
A.I.D. MAY DEEM APPROPRIATE:

(C1) INTEREST RATE AND TERMS OF REPAYMENT. THE COOPERA-  
TING COUNTRY SHALL REPAY THE LOAN TO AID IN UNITED STATES  
DOLLARS WITHIN TWENTY (20) 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 AID IN UNITED STATES DOLLARS INTEREST FROM THE DATE  
OF FIRST DISBURSEMENT OF THE LOAN AT THE RATE OF (A) TWO  
PERCENT PER ANNUM DURING THE FIRST TEN (10) YEARS, AND (B)  
THREE PERCENT PER ANNUM THEREAFTER, ON THE OUTSTANDING  
DISBURSED BALANCE OF THE LOAN AND ON ANY DUE AND UNPAID  
INTEREST ACCRUED THEREON;

(C2) SOURCE AND ORIGIN OF GOODS AND SERVICES. GOODS AND  
SERVICES FINANCED BY A.I.D. UNDER THE PROJECT SHALL HAVE  
THEIR SOURCE AND ORIGIN IN COUNTRIES INCLUDED IN A.I.D.  
GEOGRAPHIC CODE 941 EXCEPT AS A.I.D. MAY OTHERWISE AGREE  
IN WRITING. A.I.D. HAS ALSO DETERMINED THAT RAW MATERIALS  
WHEN UTILIZED AS COMPONENT COSTS OF COMMODITIES TO BE  
MANUFACTURED IN THE PHILIPPINES BY LOCAL MANUFACTURERS ARE  
ALSO ELIGIBLE FOR LOAN FINANCING UNDER THIS LOAN WHERE  
SUCH COMPONENTS ARE IMPORTED SPECIFICALLY FOR THE PROJECT  
AND THE RAW MATERIALS HAVE THEIR SOURCE AND ORIGIN IN  
A.I.D. CODE 941 COUNTRIES. FUNDS UNDER THIS LOAN CANNOT  
BE USED FOR DOMESTIC PROCESSING COSTS;

(C3) THE COOPERATING COUNTRY SHALL COVENANT THAT THE  
BENEFICIARY WILL MAKE THE LOAN PROCEEDS AVAILABLE TO THE  
RURAL ELECTRIC COOPERATIVES ON THE SAME TERMS AND CONDI-  
TIONS AGREED UPON FOR RURAL ELECTRIC COOPERATIVES FINANCED  
UNDER THE LAST RURAL ELECTRIFICATION LOAN (492-T-0430)  
PROVIDED BY A.I.D.;

(C4) THE COOPERATING COUNTRY SHALL COVENANT THAT IT WILL  
MAKE AVAILABLE TO THE BENEFICIARY ON A TIMELY BASIS THE  
FUNDS REQUIRED FOR THE IMPLEMENTATION OF THE PROJECT;

(C5) THE COOPERATING COUNTRY SHALL COVENANT THAT IT WILL  
ABSORB ANY MAINTENANCE OF VALUE RISKS ON BEHALF OF THE  
BENEFICIARY AND THE COOPERATIVES;

(C6) THE COOPERATING COUNTRY SHALL COVENANT THAT THE  
BENEFICIARY WILL IMPLEMENT THE EVALUATION PLAN AS SET  
FORTH IN THE A.I.D. PROJECT PAPER FOR THIS PROJECT;

(C7) THE COOPERATING COUNTRY SHALL COVENANT THAT AN  
ENVIRONMENTAL ASSESSMENT WILL BE CONDUCTED BY THE PHILIP-  
PINE INTERAGENCY COMMITTEE FOR ECOLOGICAL STUDIES (ICES)  
OF THE RURAL ELECTRIFICATION PROGRAM WITH THE RESULTS AND  
RECOMMENDATIONS OF SUCH ASSESSMENT INCORPORATED INTO THE  
PROJECT IMPLEMENTATION PLAN;

(C8) THE COOPERATING COUNTRY SHALL COVENANT THAT NO  
A.I.D.-FINANCED COMMODITIES WILL BE PROVIDED TO COOPERA-  
TIVES PRIOR TO CERTIFICATION BY THE BENEFICIARY AND ITS  
CONSULTANT AS TO THE TECHNICAL, ECONOMIC, AND FINANCIAL  
SOUNDNESS OF EACH PROPOSED COOPERATIVE SYSTEM.

WILL NOTIFY MISSION AS SOON AS SUBJECT PROJECT AUTHORIZED  
INCLUDING ANY CHANGES FROM ABOVE. CHRISTOPHER

UNCLASSIFIED