

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
NATIONAL ELECTRIFICATION ADMINISTRATION (NEA)
THE REPUBLIC OF THE PHILIPPINES

**Feasibility Study
on the
Transfer of Facilities and Management
of the
69 kV Transmission Lines and Systems
from the
National Power Corporation (NPC)
to the
Private Distribution Utilities
in the
Republic of the Philippines**

Final Report

Summary

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TOKYO ELECTRIC POWER SERVICES CO., LTD.

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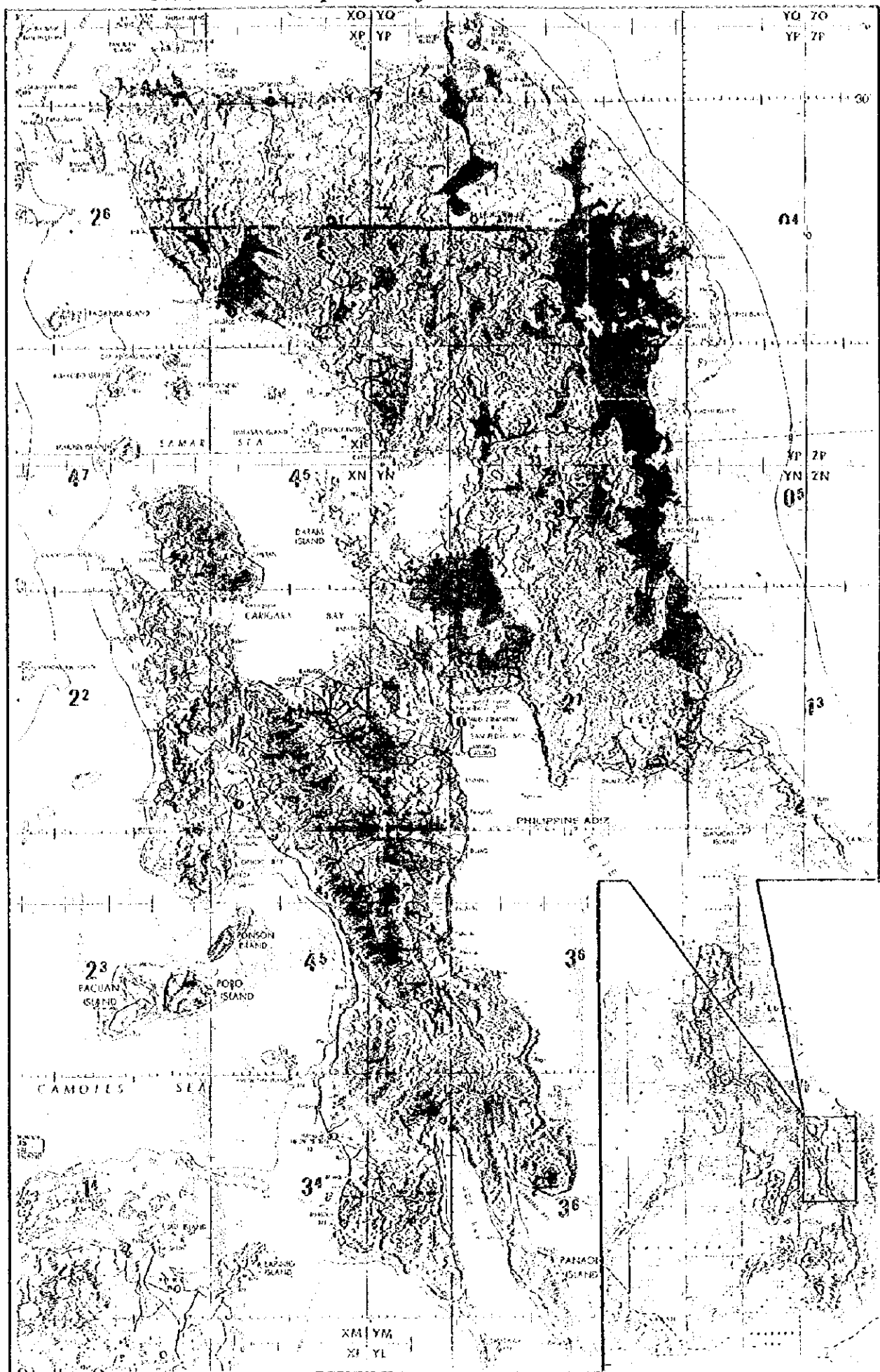
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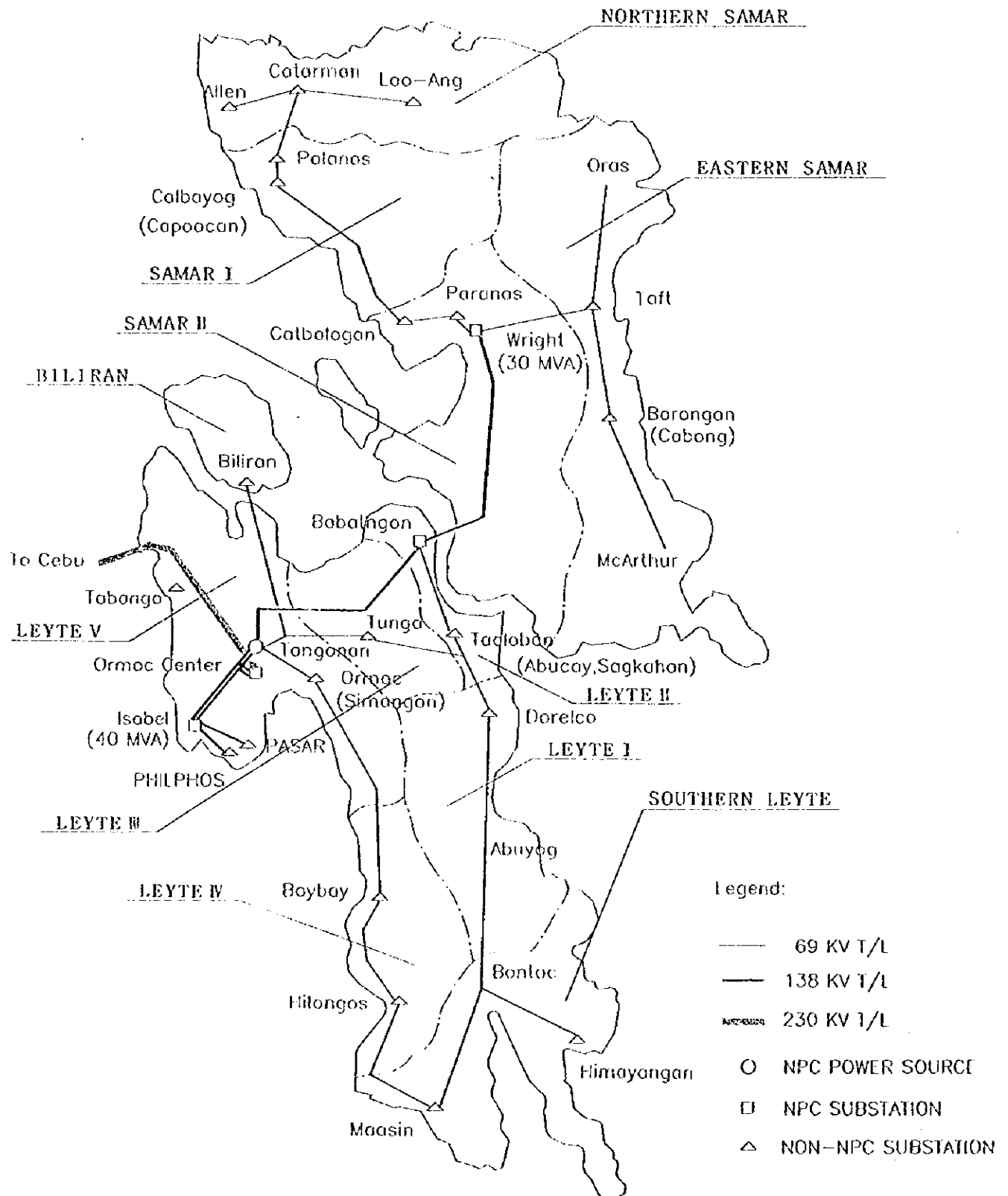
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Location Map in Leyte and Samar Islands



Transmission System in Leyte and Samar Islands



ACRONYMS / ABBREVIATIONS

ABS	Air Breaker Switch
AC	Alternating Current
ACS	Area Control System
CDA	Cooperative Development Authority
CIDA	Canadian International Development Agency
DC	Direct Current
D/L	Distribution Line
DOE	Department of Energy
EC(s)	Electric Cooperative(s)
ERA	Energy Regulatory Authority
ERB	Energy Regulatory Board
ERC	Energy Regulatory Commission
EVTTELCO	Eastern Visayas Telephone Company
GWh	Giga-watt hour
IPP	Independent Power Producer
JICA	Japan International Cooperation Agency
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt hour
MVA	Mega Voltage-Ampere
MW	Megawatt
MWh	Megawatt hour
NEA	National Electrification Administration
NEDA	National Economic and Development Authority
NPC/NAPOCOR	National Power Corporation
NRI	Nomura Research Institute, Ltd.
O&M	Operation and Maintenance
OJT	On the Job Training
PL	Profit and Loss
PNOC	Philippine National Oil Company
PVD	Primary Voltage Discount
RCC	Regional Control Center
ROW	Right-Of-Way
S/S	Substation
SOD	System Operation Department
T/L	Transmission Line
TEPSCO	Tokyo Electric Power Services Co., Ltd.
USAID	United States Agency for International Development
VHF	Very High Frequency
VRC	Visayas Regional Center



Final Report Summary

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Chapter 1: INTRODUCTION

1.1 Background and Objective

The Philippines is currently formulating a program of privatization for the purpose of introducing the competitive mechanism and increasing management efficiency by utilizing private energies.

As a part of this program, it is aiming for passage of the bill for the Omnibus Electric Power Industry Act of 1997, which is currently under deliberation in the national assembly and concerns deregulation and restructuring of the electric power industry.

Amid this activity, the NPC is planning to transfer the operation and management of 69 kV transmission lines, substations, and related facilities which it owns to the regional ECs. These ECs are in charge of maintaining and operating the related distribution facilities.

In this connection, the NEA asked the Japanese government in April 1995 through the Philippines government to conduct a feasibility study for the preparation of suitable plans for such transfer in the Eastern Visayas region (consisting of Leyte and Samar islands). In response, the Japan International Cooperation Agency carried out a study for project selection and confirmation. As a result, JICA implemented a preliminary and preparatory study. On 29 July 1996, the JICA preparatory study team and the NEA reached an agreement on the scope of work (SW) and minutes of the meeting (MM).

It is the objective of this study to examine the feasibility of transfer of jurisdiction of 69 kV transmission line (T/L) facilities in Leyte and Samar islands currently owned by the NPC to private distribution utilities, and related measures to put the operation on commercial footing.

1.2 Contents

1.2.1 Scope and Items of Investigation

- (1) The study covers the 11 rural ECs in Region VIII on Leyte and Samar islands, and the target of the study year is 2005.
- (2) The study was conducted in two phases, as follows.

Phase 1: Review of available data and information, and analysis of the current situation

Phase 2: Preparation of a program for transfer of the 69 kV transmission lines and systems

1.3 Activities of the Study Team

From December 1996 to March 1998, the JICA study team engaged in the following activities in the Philippines.

- The study team implemented the field study four times, and drew up reports, experienced and consulted with the NEA counterpart.
- The study team carried out seminars three times in Leyte island.
- The study team also carried out steering committees three times in Leyte island to determine the future direction.

1.4 List of Concerned Parties and Members

The concerned parties and members are as follows.

- NEA (National Electrification Administration)
Teodorico P. Sanchez, Administrator and other 13 members.
- DOE (Department of Energy)
Cyril C. del Callar, Esq., Under Secretary
- NPC (National Power Corporation)
Cordell U. Rosario, Vice President, VRC(Visayas Regional Center) and other 11 members.
- NEDA (National Economic and Development Authority)
Jose S. Montero, Chief, Power and Electrification Division, Head Quarter and other 2 members.
- 11ECs (Dorelco/Leyeco I, Leyeco II, Leyeco III, Leyeco IV, Leyeco V, Soleco, Bileco, Samelco I, Samelco II, Norsamelco, Esamelco)
General Manager, manager of technical and financial department
- Moresco I (The team visited as experienced cooperative on a similar study.)
General Manager
- USAID (United States Agency for International Development)
Cynthia A. Lowry, Ph.D., Energy Program Manager and other 1 member.
- CIDA (Canadian International Development Agency)
David E. Hepburn, P. Eng. Project Manager in DESSAU

- JICA study team

Takahisa Murata	Team Leader and General Matters
Mitsuhiro Orisaka	Electric Utility Management
Tatsuhiko Murakami	Transmission and Substation Facilities
Akira Noda	Corporate Management
Masayasu Ishiguro	Institutional and Regulatory Issues

- JICA Head Office

Yuji Aonuma	Administrator
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1.5 Grant of Equipment

At the time of the second field study, the study team purchased a personal computer in Manila and made effective use of it for business forecasting applying the long-term management planning model developed by Nomura Research Institute, Ltd., (NRI) and for technology transfer. At the completion of the fourth field study, the computer sets were granted by JICA to the Philippine side.

1.6 Software Preparation

The study team provided software for the aforementioned model for managers and administrators. Owned by NRI, the software is capable of use, on the personal computer basis, for corporate management and administration. The study team also provided software for loss calculation on the distribution line developed by Tokyo Electric Power Services Co., Ltd.(TEPSCO)

1.7 Counterpart Training

During the term of the study, training was furnished in Japan to the NEA counterpart for the purpose of imparting knowledge of electric power company operation and work related to transmission, substation, and distribution facilities as practiced in Japan for 30 days from November 4 to December 3, 1997.

1.8 Staging of Seminars

During the term of the study, three seminars were staged in Tacloban, Leyte for the purpose of transfer of technology to the concerned parties on the Philippine side, as follows.

1) First seminar (held in Tacloban, Leyte on 15 July 1997)

The first seminar was held for NEA members and the general managers, financial personnel, and technical personnel at the 11 ECs. It was occupied by explanation of the transfer options and presentation of the results of analysis in the aspects of business, finances, technology, and regulation.

2) Second seminar (held in Tacloban, Leyte, on 13 October 1997)

The second seminar was held for the NEA members and the general managers, financial, and technical managers at the 11 ECs. It was devoted to an explanation of the narrowing down of the transfer options and assessment of options in the aspects of business, finances, accounting technology, and regulation.

3) Third seminar (held in Tacloban, Leyte, on 23 January 1998)

The third seminar was held for the NEA members and the general managers, financial, and technical managers at the 11 ECs. It was devoted to an explanation of the establishment of a new transmission cooperative and execution of the transfer of the 69 kV transmission lines.

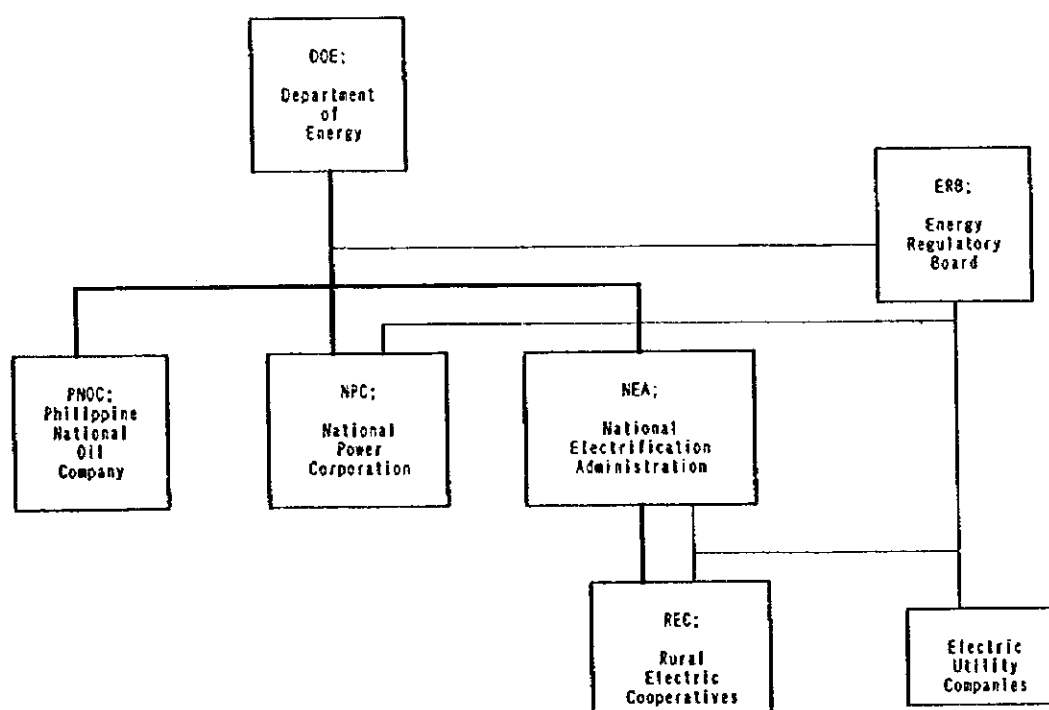
Chapter 2: GENERAL SITUATIONS IN THE PHILIPPINES AND RELEVANT STUDY AREA

2.1 Geographical Circumstances

The Philippines consists of a multitude of islands, but the 11 main islands account for about 96 percent of the national land. Eastern Visayas, which is the subject of the study, comprises six provinces, three cities, 140 municipalities, and 4,390 Barangays¹. The major city is Tacloban.

2.2 Governmental Organization and Administrative Divisions

The Philippines is a constitutional republic. The legislative organ consists of an upper (the Senate) and a lower house (the House). The administrative machinery is divided into 22 departments. The organization for the power sector is as follows.



2.3 Population and Labor Force

As of 1995, the Philippines had a population of about 68.62 million. The population of the study area in 1996 was 3.43 million.

¹ Barangay: Small village as a minimum unit of administration

As of 1996, the national unemployment rate was 8.6 percent.

2.4 Economic Situation

Supported by export and the fixed assets formation, the economy turned in a favorable performance in 1996 and attained growth of 5.7 percent, up from 1995.

In 1996, export growth was down from the level of 29 percent reached in 1995, but remained high at around 18 percent. Import also exhibited a firm trend, increasing by nearly 30 percent. Import of capital goods such as communications and electrical equipment jumped from 30 to 40 percent thanks to siting by foreign-affiliated companies, and the overall trade deficit ballooned to some 13 billion (U.S.) dollars.

The exchange rate followed a stable trend in the first half, when it hovered in the area of 26.2 pesos to the dollar, but the peso fell against the dollar in the second half, however, the rate was 26.2 pesos to the dollar as a result in 1996.

The rate of increase in consumer prices was held to 8.4 percent in 1996.

In 1997, the Philippine economy is forecast to achieve growth of about 5.1 percent, down from 1996. A scheduled hike in petroleum product prices is expected to bring the rate of consumer price increase to about 7 percent.

The Leyte-Samar region accounts for only about 2.6 percent of the gross domestic product (GDP).

The island of Leyte contains a special export processing zone. Samar island has a gross product that is only about half as large as that of Leyte, and is designated as a deeply impoverished area by the national government.

2.5 Progress of Electrification

With an awareness of the close connection between economic advancement and diffusion of electricity, the government of the Philippines instituted the National Electrification Administration (NEA) in 1969. This was followed by the establishment of rural electric cooperatives (RECs), which currently number 119 in the Philippines. The NEA provides funds for the investment and operation of RECs, and has been promoting rural electrification for the last 20 years.

According to 1996 – 2025 rural electrification plan of NEA, electrification is scheduled to be 100% by 2018. The number of electrified households reached 4.38 million in 1997. This number is only 60% of 7.36 million potential households.

The ratio of electrified households in Leyte and Samar region is 46% as of the end of June

1997.

Chapter 3: MANAGEMENT OF ELECTRIC COOPERATIVES (ECs)

3.1 Profile of ECs

ECs are non-stock, non-profit cooperatives established for the purpose of electrification and legally permitted to have a regional monopoly of power distribution in the areas under the jurisdiction of their franchise.

The management decision-making organ is a board of directors. In the daily execution of the business process, the general manager has the final say.

The main components of the EC organization are an institute division (in charge of general affairs and labor), finance division (in charge of accounting and funding), and technical division (in charge of facility maintenance and operation).

As for labor unions, Leyeco II, Leyeco V, Samelco I, and Samelco II have two, one for the supervisory union and another for the rank and file union. Dorelco has three unions. The other ECs each have one labor union. These labor unions are quite active, and particularly so at Leyeco II, III, and V.

3.2 Major Problems in Business Operation

- 1) As compared to the national average of 170, the number of customers per one employee is higher in the case of the ECs in Leyte island and lower at the ECs in Samar island. The authorities do not provide any instruction or orders regarding this average, on the grounds that capital investment must be made even in areas marked by a low investment efficiency.
- 2) EC expenditures fall into two major categories: power costs and non-power costs. Power costs, which are the cost of power purchase from the National Power Corporation (NPC), account for about 70 percent of the total. Personnel expenses occupy the majority of the non-power costs, which include customer response costs and general management costs. Reduction of these non-power costs is a key task.
- 3) In 1996, the average system loss rate for the 11 ECs was 17.3 percent. System loss consists of technical loss, which derives from facilities, and non-technical loss, which includes such factors as pilferage. System loss naturally means the loss of power which was to be sold and to yield an income, and is consequently a key issue for management.

- 4) In Leyte and Samar, the share of tariff revenues occupied by payment through financial institutions is low, ranging from about 20 percent at Leyeco II to 5 percent at Norsamelco. For this reason, there is much revenue collection work, and an increase in the efficiency of bill collection has become an important priority.

3.3 Rate Schedules and Levels

The major constituents of electricity rates are the aforementioned power cost, non-power cost, and system loss, and also amortization repayment cost and reinvestment cost.

Rate schedules for payment of the cost of power purchase from the NPC have been established in terms of grids. Leyte and Samar belong to the Visayas grid.

The price applied in sales of NPC power consists of the basic rate which is a function of demand (kW charge) and energy charges (kWh charge), and adjustments for the fuel price and foreign exchange rates.

EC power sales prices are defined in terms of category of application, i.e., residential, commercial, industrial, public buildings, and street lights and approved by ERB. The average rate in 1996 was 3.98 pesos per kWh.

3.4 Current Status of Electrification

Of the 145 municipalities in Leyte and Samar, 14 have not yet been electrified. The rate of electrification is about 54 percent in terms of the number of communities (barangays) and 46 percent in terms of the number of households.

3.5 Power Demand

Section 3.10 in the main report shows load situation, and the average annual growth in demand for electrical power in the Eastern Visayas area (Leyte and Samar) was about 5 percent annually over the 11-year period from 1986 - 1996, but hit 12.4 percent over the six-year period from 1991 to 1996. This acceleration presumably resulted from the introduction of foreign financial aid for more vigorous promotion of electrification as a matter of national policy.

3.6 Past Investment and Future Investment Plans of ECs

About 90 percent of the EC investment over the three years 1994 - 1996 was directed to electrification programs. The NEA serves as the window of the national government for foreign funding, and makes loans to ECs. The ECs employ these funds for electrification, the costs of

response to typhoons and other emergencies, and purchase of office machines and vehicles.

The plans for investment over the years 1998 - 2006 include programs for rehabilitation of distribution lines and for extension of the distribution network. ECs are anticipated to seek foreign financial assistance with these plans, as in the past.

The expansion plan of distribution lines has some difference among ECs, but each EC prepares 13.2 kV single phase and 240 V distribution line development as main plan to meet load demand growth by the progress of electrification.

3.7 Improvement of EC Management

- 1) A primary requirement for improvement of EC management is a renewal of management consciousness. It is vital to deepen the sense of responsibility of EC staff and to stimulate desires for improvement by, for example, strict linkage of business results to treatment and downward delegation of authority.
- 2) Measures in the form of low-load transformers and feeders are needed to counter the formation of additional load in order to operate distribution substation banks and feeders at an appropriate load.
- 3) Computerization must be actively encouraged and make inroads into the fields of wage calculation, processing of accounts, and purchasing of supplies.
- 4) Besides making their business process more slim and more efficient, the ECs must improve the business operation efficiency of each and every employee, review the staffing requirement, and formulate personnel plans from a long-term perspective.

3.8 Development of Human Resources

Seeing that EC technicians are to perform the operation and maintenance (O&M) work on the 69 kV transmission lines, they must be furnished with programs of training for improvement and renewal of their skills as regards conventional distribution system technology and mastery of new skills for the 69 kV work. Centering around on-the-job training (OJT), such programs could be undertaken by engineers sent from the NPC or MORESCO, or under contract from private distribution companies.

The ECs must work to recruit additional personnel through means including on loan from existing NPC employees and with the support of other private distribution companies.

Transfer of technology in such areas as construction, maintenance, drafting of transmission and substation plans, and technical analysis will be indispensable for execution of transmission line

construction, maintenance, and operation. To this end, the ECs could not only hire experts to instruct their technicians but also send their technicians to outside institutions for study and training. Furthermore, to raise the level of their power technicians in the future, it will be necessary for the ECs to provide a two-phase program of technical training (basic and specialized) and training for supervisors and managers.

3.9 Rational Operation and Management of the 69 kV Transmission Facilities and Organization

A new organization should be established for the operation and management of the 69 kV transmission facilities in the interest of efficiency and rationality. The advisable division of responsibilities between this organization and ECs is as follows.

- 1) The new organization would in the future absorb the transformation O&M departments of the ECs and perform O&M for 69/13.2 kV substations and 69 kV transmission lines.
- 2) The existing ECs will be in charge of O&M for the distribution facilities subordinate to the 69/13.2 kV substations as well as of tariff and customer services.
- 3) In order to reduce costs, the new organization should be housed in the same facilities as the existing ECs.

While responsibilities would be divided between them as noted above, the new organization for O&M of the 69 kV transmission facilities and the ECs would engage in mutual exchange of transmission and distribution technicians for mutual support in line with the idea of integrated provision of services. This arrangement could be expected to bring a more efficient use of human resources and to improve customer services by unifying windows for customer consultation and handling of complaints.

Chapter 4: PRESENT SITUATION ON FINANCIAL POSITION AND ACCOUNTING OF ECs

4.1 Division into Three Groups in terms of Earning Power and Finances

The 11 electric cooperatives (ECs) of Leyte and Samar can be divided into three groups in terms of their earning power and finances in fiscal 1996.

The first group consists of ECs on a large scale and with a good financial position. These include Leyeco II and Leyeco V, which are about three times as large as the other ECs and rank above them in terms of earnings, cash flow, and other financial aspects. Besides being on a larger scale, this group enjoys the presence of many small-scale industrial and commercial customers. At Leyeco V, the high earnings are also underpinned by superior management. Leyeco V's operating margin ratio (operating margin/revenue) is 11.1 percent, lower than those of 15.3 percent for Samelco I and 17.3 percent for Samelco II. However, its equity ratio of 26.5 percent is much higher than those of 18.1 percent for Samelco I and 6.8 percent for Samelco II.

The second group includes Leyeco III, Leyeco IV, Samelco I, and Samelco II. Samelco I and Samelco II both have higher operating margin ratios than the ECs in Group 1, but also have low equity ratios and high debt ratios. In addition, they are smaller than the ECs in the first group. They are turning a profit.

The third group consists of ECs with low earning power and problems in the aspect of finances. It includes Leyeco I, Soleco, Bileco, Esamelco, and Norsamelco. Because they are on a small scale and do not have a good business environment, they are at a disadvantage in respect of earning power and finances. The debt ratio reaches 89.7 percent at Soleco and 78.5 percent at Leyeco I. Both of these ECs also have a minus (negative) equity. Esamelco has a negative operating margin and Norsamelco has a negative net profit. Equity ratios are also very low, being 4.9 percent at the former and 3.5 percent at the latter. Repayment of loans from the NEA is being delayed at Soleco and Norsamelco, which are experiencing particularly great funding difficulties.

4.2 Causes of Deficit at ECs

The following can be cited as factors behind low earning power and deficit at ECs.

- (1) Limitation of the scope of business activities
- (2) High cost of power purchase; the cost of power purchase from the National Power Corporation (NPC) accounts for 70 percent of the total cost, and cannot be easily reduced by ECs efforts. At the same time, ECs are prohibited from purchasing from other suppliers (IPPs or other

franchises).

(3) The major firms are supplied with power directly from the NPC. Two cases in point are Pasar and Philphos, which are the two big users on Leyte island and together consume 32 million kWh per month, or about 64 percent of the total for the island. The ECs supply is therefore basically confined to small-scale users and the residential sector, and this feature makes it difficult to improve earnings.

(4) High loss rates

A. Technical loss is in the range of 7 - 8 percent

B. Non-technical and human loss is high, in the range of 10 - 15 percent (Figures are depend on interviews with ECs.)

(5) Insufficient capabilities among ECs management

Partly because they are cooperative associations, the ECs have few managers who emphasize improvement of earnings. The ECs borrow funds from the National Electrification Administration (NEA), but some managers have a low sense of responsibility for repayment. There is an awareness of borrowing official funds. Furthermore, some managers are not making a sufficient effort in management. In some cases, persons with a strong interest in politics are selected to head ECs. In this connection, the NEA is instructing ECs to appoint people with management experience to lead them.

(6) Factors behind deficit at small ECs

A. High-cost structure due to the relatively small number of customers spread over a wide area

B. High cost of associated with increasing the electrification rate

C. High system loss

These factors lie behind the low earning power of the smaller ECs.

4.3 Problems in ECs Accounting

(1) Need for auditing by external certified public accountants

The various ECs financial statements (including balance sheets, profit and loss statements, and fund management statements) are audited by external certified public accountants (CPAs), but its credibility is low. At some ECs, have low credibility that fixed assets of hydro-power plant is eliminated from the balance sheet and insufficient reserves for bad account receivable, that is inadequate. In some cases, appropriate accounting procedures have not been followed.

(2) Distortion of on-term profit by arrears in interest payable and loan repayments

A major problem in this connection is the high level of borrowings relative to income. As percentage of income, the outstanding balance of loans is in the range of 50 - 60 percent at Leyeco II, Leyeco IV, and Leyeco V, and this is a suitable level. By contrast, when it exceeds income, debt has a serious impact on management. There are extremely heavy burdens of debt at ECs where borrowings are over twice as large as income. The specific levels as multipliers of income are 2.6 at Soleco, 2.8 at Esamelco, 2.0 at Norsamelco, and 1.8 at Samelco II.

Similarly, interest payable is said to cross the crisis line when it exceeds 3 percent of income. This is the case at seven of the 11 ECs. The following can be cited as accounting problem.

Problems in the accounting aspect

Low credibility of auditing	<p>The various ECs financial statements are audited by external certified public accountants (CPAs), but its credibility is low.</p> <p>Preparation of statement of accounts by external CPAs</p> <ol style="list-style-type: none">(1) Auditing by an auditing partnership that maintains a fixed set of standards(2) Great variation in individual (non-corporate) auditing depending on the CPA
Arrears in interest payable and loan repayment	<p>Two ECs are way behind the initial schedule not only in their repayment of borrowings from the NEA but also in interest payments. Arrears in interest payable result in a corresponding apparent increase in the on-term profit because of the lower interest payment. As such, comparisons with other ECs must make revisions for arrears.</p>
Uncollectable claims	<p>The ECs have set up reserves for bad account receivable, but some of them are nevertheless saddled with bad receivable that cannot actually be recovered.</p>
Handling of mini hydropower	<ol style="list-style-type: none">(1) In 1995, the mini hydropower plant in Soleco was put out of operation by a fire. Reinauguration of this plant is reportedly difficult, partly because of structural problems. The ECs should consider writing off the plant as a special loss.(2) The mini hydropower plant now in operation in Esamelco should immediately be included in the portfolio of ECs fixed assets.
Rehabilitation standards	<p>About 5 percent of income should be posted in PL statements as rehabilitation cost. Some ECs are posting it in equity statements as customer contribution in aid of construction.</p>

Chapter 5: TRANSMISSION, SUBSTATION AND DISTRIBUTION FACILITIES IN LEYTE AND SAMAR

5.1 Current Status

1) Current system composition and transmission facilities

The transmission system on Leyte and Samar islands is owned by the NPC and consists of 230 kV interconnection line between Leyte and Cebu islands, 138 kV trunk transmission lines, and 69 kV transmission lines. The distribution system is owned by the ECs, and consists of 13.2 kV, 7.62 kV, and 240 V lines.

The current 138 kV transmission lines on Leyte and Samar include single-circuit lines running from the Tongonan geothermal power station to the Wright substation on Samar island via the Babatngon substation in eastern part of Leyte island. There are also double-circuit 138 kV lines supplying power to two large customers in the western part of Leyte.

The 69 kV transmission lines on Leyte are all single-circuit lines. The Tongonan power station supplies power to the western part, and the Babatngon station, to the eastern part. The 69 kV transmission lines on Samar are also single-circuit, and supply power to the eastern and northern parts from the Wright substation as a source.

All of the 69 kV transmission lines are strung on wooden poles. They are in a state of serious disrepair due to lack of maintenance, lack of acquisition of proper right of way (ROW), and damage from typhoons.

2) Current transformation facilities

Units of 138/69 kV substations number four on Leyte (two at Tongonan, one at Isabel, and one at Babatngon), with a combined capacity of 100 MVA, and one on Samar (Wright), with a capacity of 30 MVA. The system of transmission line protection on the secondary (69 kV) side of the 138/69 kV substations consists solely of overcurrent relays and ground-circuit overcurrent relays.

On the primary side, the 69/13.2 kV substations are equipped only with power fuses and ABSs. The feeders on the secondary side are ordinarily equipped with power fuses and reclosers. Only very few of these substations are installed with on-load tap changers for transformers; voltage regulators are added for performance of adjustment. None of these substations is equipped with protective relays.

The 69/13.2 kV substations are connected by 69 kV transmission lines and single-circuit T-

type branch.

3) Current distribution facilities

As for the composition of the 13.2 kV distribution lines of the ECs, three-phase lines are installed only for main feeders leading from 69 kV substations and in areas with a comparatively dense concentration of demand. Houses in sparsely populated areas are supplied through V-phase or single-phase lines.

The main types of 240 V distribution lines are open secondary strung on independent poles and underbuilt strung on poles also used for 13.2 kV lines. The EC facilities are basically oriented toward the underbuilt type.

5.2 Network Coordination System

1) Current system of central control

The organization for power system operation control in the NPC is topped by the System Operation Division (SOD). The NPC divides the country into the three regions of Luzon, Visayas, and Mindanao, and beneath the SOD are three regional control centers (RCCs), one for each region. Attached to the RCCs are area control systems (ACSSs), which operate facilities.

In fact, the operation and control of the system on Leyte and Samar islands is performed by the RCC on Cebu island. This RCC issues instructions to the ACS for frequency adjustment, power station operation, and switch operation.

2) Current communications system

The NPC system of communications on Leyte and Samar islands consists of microwave circuit links to the Visayas Regional Center (VRC) on Cebu island and to Luzon island via the unmanned relay station at Palompon. There are also links between substations based on power line conveyance and VHF communications. In some cases, data are exchanged by means of the public telephone lines.

For communication with each other, ECs use mainly VHF wireless circuits, but also make some use of the public telephone circuits (EVTELCO). All of the ECs have wireless ground stations and exchange information via mobile communications.

Communication between the NPC and the ECs employs both wireless circuits and the public telephone circuits.

3) System analysis

According to the power flow analysis conducted by the NPC for 2005, the voltage in certain parts of the system may decline somewhat (for instance, to 65 kV in the Catarman section), but this voltage drop will not be a major problem for the transmission system as a whole.

Short- and ground-circuit capacities should pose no particular problem; the capacities of 69 kV breakers throughout the Leyte and Samar area are under 20 kA.

5.3 System Loss

For the first three quarters of 1996, the highest rate of EC system loss was posted by Leyeco I at 23.95 percent, and the rate was above 15 percent at eight ECs. Leyeco I and Samelco II have succeeded in reducing their loss relative to the past, but the rate has been on roughly the same level over the last ten years at the other ECs.

The main causes of technical loss are long-distance distribution because of demand dispersion, and the flow of current to the neutral phase due to phase imbalance. The main causes of non-technical loss are pilferage and non-payment.

5.4 Natural Conditions and Frequency of Outage

To view the trend of outage in terms of the enterprise at fault (NPC versus ECs), outage time per year averaged 362 hours for the NPC and 469 hours for each EC. The corresponding averages for outage frequency were 106 times and 160 times. On the average, yearly outage time at each EC totaled nearly 34 days (NPC plus EC) on the average.

In the NPC facilities, the occurrence of a trouble can lead to outage over a wide area. The data for outage suggest that the cause most frequently lies on the side of the ECs. However, there is also a need for improvement as regards the frequency and duration of NPC trouble in light of the magnitude of NPC outages.

5.5 Tongonan Geothermal Power Station

The Tongonan geothermal power station consists of three units with a combined capacity of 112.5 MW. It has two 138 kV transmission lines leading to Isabel and one line leading to Wright. There are also 138/69 kV transformers to convert voltage to 69 kV for transmission through one line leading to Maasin and another leading to Tunga.

5.6 Future Interconnection Program

To supply energy from the Tongonan power station to islands other than Leyte and Samar, there are plans for connection through 350 kV DC transmission lines from Luzon island to Mindanao island via Leyte and for connection of Leyte and Bohol through 138 kV AC lines. All interconnection transmission lines are to be completed in 2000. The Leyte-Bohol interconnection plan would have an influence on the transfer plan that is the subject of this study, because it would entail use of the Ormoc-Maasin 69 kV transmission lines on Leyte until the completion of the plans in 2000.

As for system plans on Leyte and Samar islands, there are plans for a new 138 kV route between Ormoc and Wright. The only new 69 kV route under construction is the McArthur-Guiuan one.

5.7 Technical Standards

The ECs make use of the standards provided by the NEA in the form of the NEA engineering bulletins.

The bulletin standards center around application for equipment (mainly distribution lines and distribution transformer units), facility plans, design drawings, construction, and O&M technology, but also cover a wide range of other areas, including feeder lines to customers, specifications for meters, perspectives on power loss and supply reliability, and contents of requisite technical analysis. The bulletins also treat 69 kV transmission line specifications and design. Overall, they offer comprehensive coverage of a wide area of technology.

5.8 Level of ECs Technology

- The ECs do not make system analyses on a regular basis. For this reason, they do not have an accurate grasp of the current status of the system, including items such as loss, power flow, and voltage drop.
- System operation is performed at the instruction of the NPC; the ECs do not have their own know-how for the same. They also don't own fully adequate communications systems.
- The ECs make use of the technical standards in the bulletins prepared by the NEA, but it is doubtful that all EC technicians fully understand and apply these standards.

5.9 Points for Improvement in the Current Technology of ECs

Based on their experience with distribution line work, the ECs in Region VIII are thought to have the know-how for construction of poles and maintenance of the same. However, receipt of the transfer of 69 kV transmission lines will call for more sophisticated technology and modern technology for maintenance and management of high-voltage facilities.

The following are comments on areas for improvement of facilities, facility plans, and system operation in consideration of current EC technical levels, the status of facilities, and the peripheral environment.

- Continued reliance on wooden poles to string 69 kV transmission lines would necessitate incorporation of measures for pole reinforcement and prevention of deterioration into design right from the stage of construction. It would also be necessary to make provisions for periodic maintenance and to operate the facilities with full consideration of work safety.
- Execution of the power system plans will require accurate forecasting of the demand, acquisition of the necessary transmission and distribution line routes, and pursuit of economic merit. Similarly, an improvement in reliability will require a decrease in the outage duration and frequency. The means to this end include power system analysis for constant checking of power flow, system stability, short- and ground-circuit capacity, and voltage drop.
- The system must be operated with coordination between the 138 and 69 kV transmission lines. In the near future, the DC transmission lines will be connected to the Ormac substation, and any related difficulties must be resolved together with the NPC. It can also be noted that the NPC issues orders for system operation based on system priorities and the actual operation data, and that the ECs must follow these orders.

6. REGULATORY ISSUES

There is a concern about the transfer of the 69kV transmission system from a regulatory viewpoint. After the passage of the Omnibus Electric Power Industry Bill currently discussed in the national assemblies, not only the National Power Corporation (NPC) but also the governmental organizations and their authorities, including the National Electrification Administration (NEA), are expected to be reformed through the liberalization of the power industry. Moreover, rationalization of the electric cooperative (EC) sector through merger, acquisition, and consolidation are also expected to start.

6.1 1997 Omnibus Electric Power Industry Bill

The future structure of the power industry will fully depend on the passage of the Omnibus Bill. Both the House and Senate committees have consolidated their versions into individual bills, and the Joint Committee of the House and Senate will consolidate these bills into a final one by fixing differences between the House and Senate versions. This consolidation by the Joint Committee and the passage of the bill by both the House and Senate is expected by the end of February 1998 because the presidential election is to be held in May 1998. If the Omnibus Bill is not passed by this election, it will be abandoned. In other words, the national assembly must start their discussion of bill for power sector reform beginning with the start of the next session.

Although there are several differences between the currently discussed House Bill No. 9991 and Senate Bill No. 2016 (SB2016)², they are being consolidated into one bill³.

The objective of the Omnibus Bill is to reform the power industry in order to improve the industry's efficiency and productivity. One of the major issues is the disbundling and privatization of the NPC. The generation and transmission subsectors will be split, the competitive market of generators, i.e., pool market, will be established, and free access to the transmission lines will be allowed.

² SB2016 was replaced with the Senate Energy Committee Report—Committee Report No. 868—on January 12, 1998. This committee report will be the final version of the Senate bill, (i.e., SB2448).

³ According to information from the DOE, both the House and Senate floors are expected to pass their final versions of the bill individually by the end of January 1998.

6.2 Status of Electric Cooperatives

There is a big argument in the government about the status of electric cooperatives (ECs). In principle, all cooperatives were required to register with the Cooperative Development Authority (CDA) as stock cooperatives. But existing ECs have been defined exceptionally as non-stock and non-profit organizations registered with the NEA.

The argument on the status of ECs as non-stock and -profit organizations has continued between the NEA and CDA, and both administrations have not reached a common conclusion.

But the conclusion for this dispute seems to rest on the CDA's opinion. This is because:

- The Senate version of the Omnibus Bill has a provision for amendment of PD269 and change of the EC's status from a non-profit cooperative to a stock cooperative in order to make EC management sound⁴, and registration of the new ECs as stock cooperatives with the CDA; and
- Through discussion of the Omnibus Bill in the national assembly, the role of the NEA becomes to clarify, and both the Senate and House intend to remove the NEA's regulatory power.

6.3 Discussion of Issues Relating to the Transfer of the Transmission Lines

With regard to the 69kV transmission lines which are the focus of this study, we suggest that potential problems relating to regulations and laws exist. Basically, the transfer of the transmission lines is to be implemented as part of the ongoing sector reform stipulated in the Omnibus Bill. This affects not only the physical transfer of the assets but also the changes in the future roles of the NPC, NEA, and ECs. Issues arising from the transfer are as follows:

(1) Transfer of the sub-transmission lines

Both the House and Senate versions of the Omnibus Bill state that the NPC shall relinquish its sub-transmission system to the electric utilities to the extent practical; those not acquired will remain with the NPC until a utility gets them. However, clear definitions of trunklines and sublines do not exist, and we cannot clarify the legal status of the 69kV lines in Leyte and Samar. The final conclusion is expected to be reached by the PLN based on its plans for future expansion of transmission facilities and its management decision-making⁵.

⁴ S2016, Sec. 23.

⁵ We were informed that on January 26, 1998, the NPC director board approved its policy for the transfer of sub-transmission lines. Transmission lines below 69 kV in Leyte and Samar, 230 kV in Luzon, and 138 kV in Mindanao are to be defined as sub-transmission lines, but we could not receive other conditions in detail.

(2) Rationalization of EC Structure through Consolidation

We cannot evade the issue of rationalization of the EC structure. As shown clearly in the Senate and House bills, one of the most important aims of the Omnibus Bill is to rationalize the structure of distribution utilities and make them financially sound. The 11 ECs in Leyte and Samar are required to streamline their management, pursuing higher economies of scale through consolidation. Although we see political difficulties possibly in implementing rationalization, we cannot avoid such discussion.

As part of the rationalization of ECs, discussion on the organizational structure of the ECs is in progress. The Senate version of the Omnibus Bill intends to enforce the change of EC status as cooperative, and the current non-profit ECs must become stock cooperatives. The NEA will face a similar issue relating to its role. Both the Senate and House versions limit the NEA's future role, and regulatory power relating to EC management will be transferred to another agency.

Rationalization of EC structure is necessary according to market-economy principles, but we see several problems arising in the process. Firstly, it is not easy to change EC status from non-profit cooperative to stock cooperative. For example, the membership fee must increase from 5 pesos to 100 pesos. A more substantial financial burden for the members is the allocation of shares. If shares are allocated equally among members, there is a great uncertainty whether all members could afford their share capitals, especially in small and financially weak ECs. If an EC fails to issue and pay-up its shares, it cannot register with the CDA as a stock cooperative. Furthermore, if the EC loses its status as a cooperative, it will also lose the privileges of a cooperative, including preferential tax treatment, and is expected to experience difficulties in its operation.

Given these conditions, it is necessary to merge financially weak and small cooperatives with strong and bigger ones and to streamline their operation. This is the requirement of the era of the market economy. In this context, now is the time for the 11 ECs to prepare for future consolidation.

6.4 NEA Power and Role in the Future

The role of the NEA is being clarified. As seen in the Omnibus Bill, NEA responsibility is to be limited to the following two functions: Management training for small utilities and ECs, and channeling grants from bi- and multilateral organizations to investment in the power infrastructure in order to facilitate electrification throughout the country.

The NEA's other regulatory powers, including power tariffs and registration of ECs, will be transferred to the ERA (or ERC) and CDA. The aim of the Omnibus Bill is to apply the market mechanism to rural electrification as far as possible in order to strengthen the basis for business

operation, and finally to make electricity supply on commercial basis possible. To attain this target, the NEA is strongly expected to show its leadership in implementing rationalization of the EC management structure, making the EC financial position sound by correcting the present subsidy system, and making clear the responsibility for EC management.

Chapter 7: PREMISES OF THE STUDY

7.1 Scope of Facilities to be Transferred

The 69 kV transmission line facilities on Leyte and Samar consist of the lines proper (i.e., the wooden poles, pole fittings, and conductors) as well as breakers, ABS switching equipment, measurement devices, protection and control devices, communications facilities, load dispatching facilities, and the incidental buildings and supporting structures with foundation.

Of these, it was thought that breakers, measurement devices, and protection and control devices would not be subjects of transfer given their nature. The communications and load dispatching facilities were also regarded as not within the scope of transfer.

As such, the scope of transfer was defined as the 69 kV transmission lines extending from the 69 kV outlet of the 138 kV NPC substations, inclusive of the wooden poles, pole fittings, conductor, and ABS and breakers on the line.

7.2 Demand Forecast and Review

The study team made a forecast of the demand for electric power on Leyte and Samar. This forecast was based on the trend of the power consumption nationwide and on Leyte and Samar, the gross domestic product (GDP), gross regional domestic product (GRDP), and demand elasticity over the last 11 years, and derived from forecasts of the future GDP and GRDP growth rates and power elasticity. The results were compared with NEA forecast figures. These are shown in the Table 7.2-1 and Fig. 7.2-1 in the main report.

The EC and NEA forecast figures are fairly close to the study team forecast figures in the high estimation case. The study team decided to employ the figures of its low estimation, which represent tougher management conditions, in the financial analysis.

7.3 Application of the Unbundled Power Tariff System

Amid the currents of introduction of the competitive mechanism and promotion of privatization in the interest of more efficient management, the NPC is planning not only to detach its generation division but also to switch to a new system of unbundled power tariffs in order to enable open access to its transmission lines. This new system will go into effect if it is approved by the ERB.

The estimates of future tariffs in this study were consequently premised on this new system.

The main point of difference from the current tariff system was assumed to be the adoption of

time-of-use (peak and off-peak) rates for generation charge and, for transmission delivery charge, the commitment to open access enabling use of transmission lines by any party with payment of use fees. At the same time, it was assumed that the primary voltage discount (PVD) system in the existing system would be abolished.

7.4 Assets Value of 69 kV Transmission Lines

1) Assets value of the existing 69 kV transmission lines according to the NPC

There are two types of assets value for the 69 kV transmission facilities on Leyte and Samar islands: the revalued price and the sound value.

In terms of sound value, the assets value of the facilities came to 396.1 million pesos at the end of 1996. In terms of the revalued price, which takes account of inflation, it was over twice as high at 848.5 million pesos.

In this study, a field study was made of some of the transmission lines to be transferred, and the findings were compared with the NPC assets value figures (see Section 9-1 in the main report).

2) NPC rehabilitation plans for 69 kV transmission lines

The NPC has drafted plans for the rehabilitation of 69 kV transmission lines on Leyte and Samar islands in 1997 and 1998. This rehabilitation may be viewed as a type of leading capital investment made in anticipation of transfer of the 69 kV transmission facilities to ECs and other electric companies.

The cost of the rehabilitation planned for Leyte and Samar by the NPC for 1997 and 1998 comes to 53.1 million pesos. The study recognized a need for investigation in terms of the sum of addition of this rehabilitation price and the transfer price.

The assets values employed for the 69 kV transmission lines in this study are as follows.

Assets values for 69 kV transmission lines in this study

Unit: thousand pesos

	Revalued Price	Sound Value
A. Value of existing lines as of the end of 1996	848,454	396,109
B. Price of rehabilitation implemented in 1997 and 1998	53,062	53,062
Total (A+B)	901,516	449,171

Source: The A figures are reported from Table 7.4.1, and the B figures, from Table 7.4.2 in the main report.

7.5 Rehabilitation Plans of the 69 kV Transmission Lines

A calculation was made of the costs required for smooth operation of the 69 kV transmission lines subsequent to their transfer to distribution companies. This calculation was based on the following perspectives.

- 1) Maintenance costs vary from year to year because of difference in respect of damage from typhoons. As such, the average figure based on actual NPC data for past years was employed for the future O&M cost.
- 2) The rehabilitation cost required for the future was estimated on the basis of the findings of a field study of 10 kilometers of line by the study team.

Chapter 8: PLANS FOR TRANSFER OF THE 69 kV T/L FACILITIES

The study team investigated options for the transfer of the 69 kV T/L facilities with a view to putting the business of the ECs on Leyte and Samar on commercial footing after the transfer amid the competition in the power sector anticipated upon passage of the Omnibus Act.

The environment of the electric power business for the ECs is expected to become harsher after the passage of the Omnibus Act, as follows.

- There is a high possibility of the transformation of ECs into stock holding cooperatives to prevent the loss of tax privileges which they have enjoyed thus far.
- The NPC is transferring sub-transmission lines to distribution enterprises. In the event of transfer to enterprises other than the ECs, the cost associated with maintenance of the 69 kV transmission lines, which are now in poor condition, could lead to a price hike for power purchased by the ECs.
- There is apprehension that introduction of the competitive mechanism will make the financial situation of the financially weak ECs even worse.

For the ECs, the transfer of the 69 kV transmission lines represents a chance for entry into new business in the face of these environmental changes, and could be linked to an improvement of their finances. The following can be cited as advantages of the transfer for the ECs.

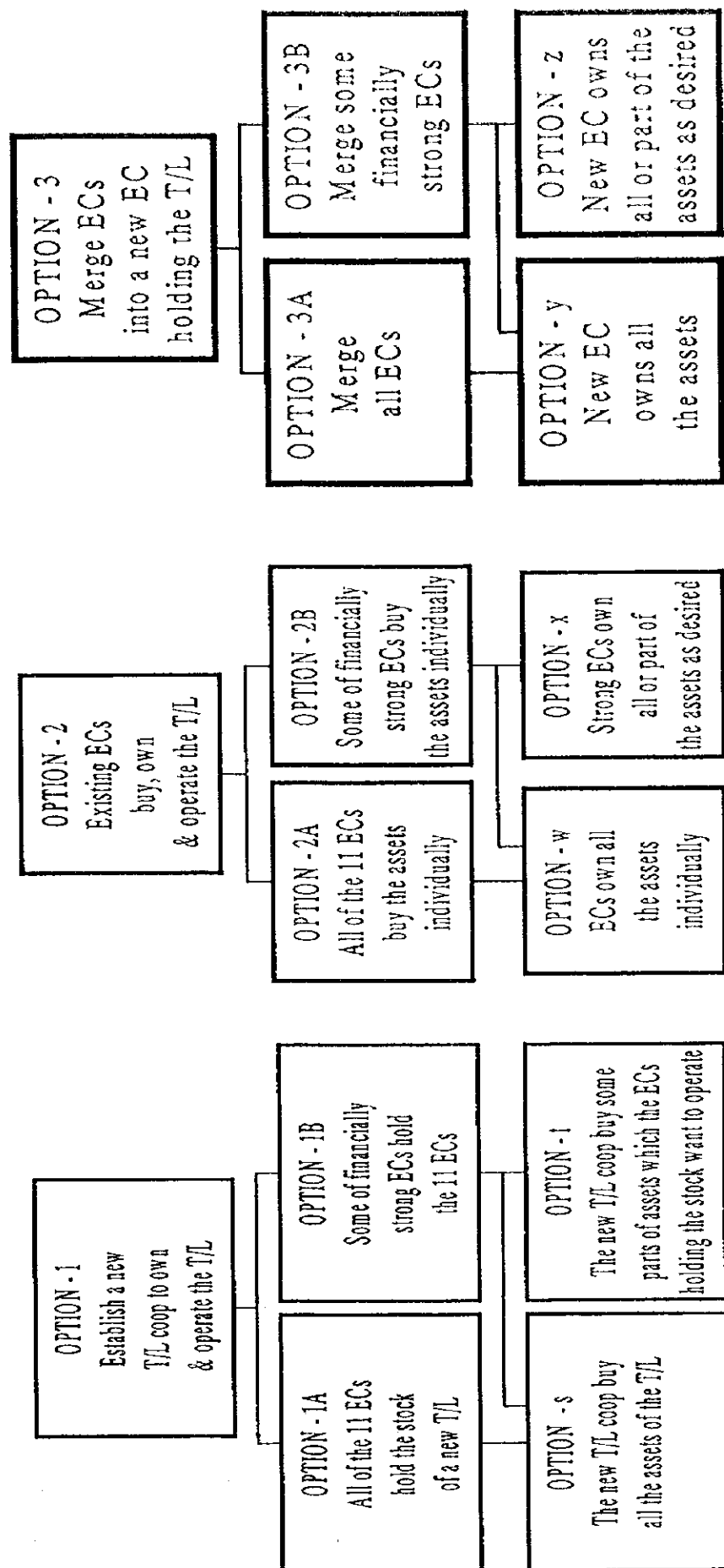
- The maintenance of the transmission lines by the ECs will enable them to improve the condition of these facilities and promote business integrating transmission and distribution.
- The 69 kV voltage could possibly be used to develop additional demand.

8.1 Options for Transfer of the 69 kV T/L Facilities

As noted above, the ECs must be involved in the operation of the 69 kV transmission lines in some form. The study team identified three basic options in this connection, and also considered two derivative cases for each: that of participation of only the financially strong ECs in the business, and that of transfer of only part of the facilities.

- Option 1: transfer to a newly established transmission cooperative
- Option 2: transfer directly to the existing ECs
- Option 3: transfer to an amalgamation of the ECs

Table 8 - 1 Options for the transfer of the 69 kV T/L



8.2 Narrowing Down and Assessment of Transfer Options

Of the aforementioned options, that of transfer of only a portion of the 69 kV transmission lines was excluded from consideration because it runs counter to the intent of the study.

The other options were assessed in the aspects of management, facilities and technology, finances and costs, and regulatory issues. That of transfer to the amalgamated 11 ECs (Option 3A) was selected as the best option, for the following reasons.

- Option 3A offers the most advantages, including curtailment of personnel expenses and efficient operation of office space due to the amalgamation, capability for blanket transfer of the 69 kV transmission lines, the earliest improvement of the balance of payments, and conformance with the orientation of the Omnibus Act.
- Option 3B (transfer to only the few financially strong ECs) would also be conceivable, but the large scale of the 69 kV lines as assets would make it difficult for only a few ECs to manage them as a business.

The idea (amalgamation of ECs) has been proposed by other aid institutions as well, but was not accepted. In light of such past particulars, it was considered impossible to amalgamate the 11 ECs in the near future. The study team consequently selected Option 1A (transfer to a new cooperative established with the participation of the 11 ECs) as the next best one as shown in the Table 8.2-1.

Table 8.2 - 1 The results of investigation for transfer options of 69kV T/Ls and systems (figure denotes point)

Transfer options Items of assessment	Option 1		Option 2		Option 3	
	Establishment of a new transmission cooperative		Purchase of transmission facilities by the existing ECs and division among them		Amalgamation of the existing ECs	
	1A Participation by all 11 ECs	1B Participation by the 2 or 3 financially sound ECs	2A Purchase by all 11 ECs	2B Purchase by the 2 or 3 financially sound ECs	3A Purchase by the new EC created by amalgamation of all 11 ECs	3B Purchase by an amalgamation of the 2 or 3 financially sound ECs
	S Purchase of all assets by the new cooperative		W Purchase by the existing ECs and division among them		Y Purchase by the amalgamated ECs	
Management aspect	3	2	1	1	5	3
Organization	Need for a new company (the new T/L coop.) for management of T/L O & M	Need for a new company (the new T/L coop.) for management of T/L O & M	Need for a new organization to be instituted in each EC on Leyte and Samar for O & M	Need for a new organization to be instituted in each participating EC for T/L O & M	Need for a new organization to be instituted in the amalgamated EC for T/L O & M	Need for a new organization to be instituted in the amalgamated EC for T/L O & M
Personnel	Newly recruited 70 personnel for T/L O & M	Newly recruited 70 personnel for T/L O & M	Newly recruited 10 personnel in each EC, total 110 for T/L O & M	Newly recruited total 80 personnel for T/L O & M	Need 72 personnel for T/L O & M, but reposting of surplus personnel freed by the amalgamation to O & M, no need for additional hiring	Need 72 personnel for T/L O & M, and reposting of surplus personnel freed by the amalgamation to O & M principally, but probable need for additional hiring as well
Administrative building	Need for acquisition of 1,000 sq. meter of land and construction of a building with an area of 500 sq. meter on both Leyte and Samar, at a combined expense of 16 million pesos	Need for acquisition of 1,000 sq. meter of land and construction of a building with an area of 500 sq. meter on both Leyte and Samar, at a combined expense of 16 million pesos	No need for construction of a new building, but need for addition of about 140 sq. meter at each EC (and 1,540 sq. meter total) at a combined expense of 15 million pesos	No need for construction of a new building, but need for addition at the participating ECs, at a combined expense of 9 million pesos	Effective use of the existing EC property (land and buildings); no need for additions	Effective use of the property of the participating ECs and no additions as a general rule, but additional property could become necessary depending on the number of participating ECs
Power tariff (at the year 2001)	T/L operation cost is 0.25 pesos/kWh	T/L operation cost is 0.25 pesos/kWh	Difference of T/L operation cost depending on the EC; variation from 0.05 to 0.80 pesos/kWh	Difference of T/L operation cost depending on the EC; variation from 0.05 to 0.80 pesos/kWh	T/L operation cost is 0.22 pesos/kWh	T/L operation cost is 0.22 pesos/kWh
Rationalization	Relative to Option 2A, decrease in the personnel requirement by 40, but increase in the property cost requirement by 1 million pesos	Relative to Option 2A, decrease in the personnel requirement by 40, but increase in the property cost requirement by 1 million pesos	Relative to Option 1A, increase in the personnel requirement by 40, but decrease in the property cost requirement by 1 million pesos	Relative to Option 1A, increase in the personnel requirement by 10, but decrease in the property cost requirement by 7 million pesos	Highest degree of rationality; acquisition of technical and other personnel for the T/L facilities through reposting of surplus freed by the amalgamation, and no need for a new building	Inferior to Option 3A; reposting of surplus personnel freed by the amalgamation, and no need for a new building, but building expansion could possibly become necessary
Facilities and technology aspect	3	3	1	1	5	4
	No problem of division, but involvement of 12 enterprises in one power system would complicate the command scheme for system operation	No problem of division, but involvement of 12 enterprises in one power system would complicate the command scheme for system operation	Division of the T/Ls among the 11 ECs would blur supply responsibilities, with adverse effects on supply stability	Division of the T/Ls among the 2 or 3 ECs would blur supply responsibilities, with adverse effects on supply stability, but less so than in Option 2A	No problem of division, and involvement of only one enterprise in the power system, simplifying operation	No problem of division, but involvement of 8 - 9 enterprises in the power system, with complications relative to Option 3A
Finances and costs aspect	4	1	3	1	5	1
	Decrease in personnel costs by 37 % relative to the case of division; operation cost of 103 million pesos in 2001; not deficit for the 11 ECs taken together continuing for the first two years	The only financially strong ECs are Leyeco V and II, and it would be impossible to raise 449 million pesos from outside source based solely on the earning power of these two enterprises; insufficient cash flow as well	The financially strong ECs (Leyeco V and II) could buy and operate their share of the facilities, but their financial health would deteriorate as a result; impossible for 7 ECs	The combined cash flow of Leyeco V and II in 1996 came to only 32.8 million pesos; inability to bear the burden of interest payments associated with purchase	The best effect for rationalizing management; T/L facilities could be operated by the existing personnel; operation cost of 83 million pesos and cash flow of 6 million pesos in 2001	Even in the event of amalgamation of only Leyeco V and II, the earning power of only two enterprises would not be able to overcome difficulties in the aspects of funding and credit guarantee
Regulatory aspect	3	3	1	1	5	4
	While it would not make a direct contribution to integration of the 11 ECs immediately, the establishment of the new enterprises for the T/L facilities could possibly occasion future integration	While it would not make a direct contribution to integration of the 11 ECs immediately, the establishment of the new enterprises for the T/L facilities could possibly occasion future integration	Most out of conformance with the aim of strengthening EC finances through integration	Out of conformance with the aim of strengthening EC finances through integration	Most in conformance with the aim of strengthening EC finances through integration	In conformance with the aim of strengthening EC finances through integration overall score
Total	13	9	6	4	20	12

8.3 Preparation of a Draft Plan for Execution of the Transfer of 69 kV transmission lines

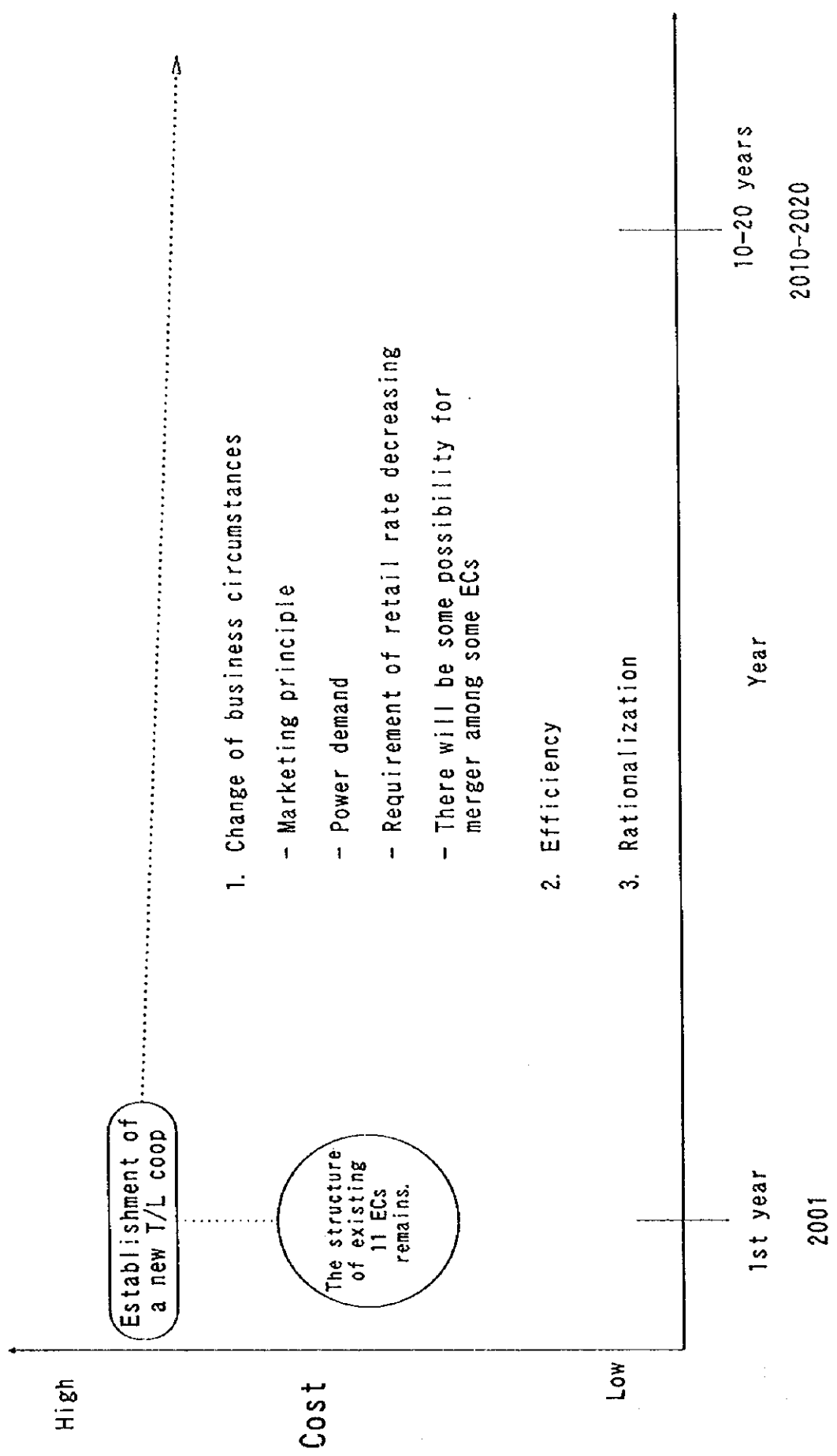
The study team prepared a draft plan consisting of two stages: that of preparations for establishment of the new transmission cooperative in 2001 (extending up to and including 2000), and that of execution (2001 and succeeding years).

Because it is devoted to preparations for establishment of the new cooperative, the major task in the first stage is determinations on items necessary for the business. These may be exemplified by the following.

- 1) Recruitment of participants in the new cooperative
- 2) Establishment of an organ for conference
- 3) Preparation of the organizational setup
- 4) Transfer price negotiation with the NPC
- 5) Formulation of business policy
- 6) Training of technicians

The second stage (beginning in 2001) is devoted to execution of work required for operation of the 69 kV transmission lines on commercial footing. These include preparation and implementation of plans for facility rehabilitation and maintenance, establishment of the setup for maintenance and operation, preparation and implementation of business operation plans, and preparation of training programs for technicians.

Figure 8.3 Scenario for Implementation



Chapter 9: APPRAISAL OF TRANSMISSION FACILITIES AND ITS IMPACT TO THE LONG-RANGE PLANNING

9.1 Assets Appraisal for 69 kV Transmission Facilities

The assets appraisal of the 69 kV transmission facilities and the purchasing price based on this appraisal exert an enormous impact on future profits. In the first place, it is advisable to consider various methods of assets appraisal. This section concerns calculation and appraisal of the value of transmission facilities.

- Revalued price: existing facility price plus (ratio of inflation plus interest of borrowing money plus foreign exchange adjustment)
- Sound value: based on the present construction cost of existing facility minus (rehabilitation plus repair and maintenance cost)
- Market value: market maker is demand side and supply.

Negotiation of a 69 kV transmission facility that should be start from sound value.

Sound value is the present cost of construction of new facilities excluding (minus) the cost of rehabilitation, maintenance, and repair. This appraisal is based on the current construction cost with subtraction of the rehabilitation cost. To estimate sound value, it is necessary to make a field study of the actual facilities to evaluate them

The NPC appraisals are essentially appropriate as far as sound value is concerned. The following observations can be made in this connection.

- a) The field surveys in the two cases revealed that the NPC appraisal of sound value was basically appropriate. The gap between our appraisal and that of the NPC was about 14 percent for Leyte. The Wright-Calbayog route should negotiate 15 –20 percent discount of sound value price for the purchase of the facility.
- b) The NPC made simple calculations for totals based on standard formulas, and there was some roughness.
- c) The ECs should promptly conduct their own research and investigation of the transfer in order to accumulate know-how of use in the negotiations.

9.2 Study of 69 kV Transmission Business Transfer Cost and Operating Income and Expenditures

First, a calculation will be made of the transfer price in the event of transfer of the 69 kV

transmission business to the ECs as well as the annual O&M cost and the O&M cost over the next ten years (the business start 2001 year). Then, a calculation will be made of investment for facility rehabilitation over the next ten years. The new transmission Cooperative have to finance for purchase of T/L assets. There are three types of finance scheme, one is borrowing from NEA or bank, the two is leasing method and the three is installment method. If the price applied in transfer from the NPC is high, the cost of operation of newly established transmission services will also be high. A study will be reveal a impact of transmission business cost to ECs. Next, there will be a calculation of business income and expenditures of the 11 ECs combined into a single new EC, and of the same over the next ten years. This will be followed by a calculation of the 69 kV transmission business cost at the new EC as the receiver of the transfer from the NPC and independent operator of the business. The findings will provide the basis for a final study of business income and expenditures at the new EC. The 69 kV transmission business cost will be calculated as the transmission operating cost of the new EC, and an analysis will be made of the degree of impact exerted on earnings by the cost burden associated with this cost.

a) T/L facilities financed by the NEA or a financial institution

In this case, the guideline for the cost of transfer of the 69 kV T/L business would be the sound value (the lowest purchasing price). The sound value of the facilities is estimated at 449 million pesos in terms of the 2001 transfer price. If this price were paid entirely with funds borrowed at an annual interest rate of 12 percent, the annual interest payment would be extremely high, in the area of 53.9 million pesos. The annual depreciation cost (assuming straight-line depreciation at an annual rate of 3.3 percent) would amount to 15.0 million pesos in the initial year and the same (15.0 million pesos) in 2010.

b) Leasing case

This case assumes that the T/L facility operating cooperative will conclude a 20-year leasing contract with a leasing company. Because of the short term and the management fee, leasing would be more costly than borrowing over the long term. Over the short term, however, the operating cost for the first five years would be lower because the interest cost would be based on the 20-year average cost.

c) Transfer in 20-year installments

In this case, the T/L facilities would be transferred not all at once, but in installments over a period of 20 years. First, the transmission cooperative would conclude a sales contract with the NPC, stipulating transfer in installments over this period. The transmission cooperative would pay the depreciation cost only for that portion of the facilities already transferred. Consequently, the initial burden of depreciation cost would be light. The interest burden would be particularly

small for the first five years because it would be necessary to raise additional funds only for the additional transfer of facilities each year. An additional drawback would be the procedural complexity and cost associated with transfer of facilities each year.

9.3 Business Plans for the New EC (aggregate of the 11 ECs in Region VIII)

- Continuation of net deficit for two years -

A forecast was made of the business of the new EC (aggregate total for the 11 ECs in Region VIII) over the ten-year period 1997 - 2006. What impact would transfer of the 69 kV transmission facilities from the NPC at the Sound value price of 449 million pesos have on profits and finances? In the initial year (2001), the annual burden would reach 102.7 million pesos. This burden would consist of interest payments, personnel costs, facility operating costs, and investment for facility maintenance. The prime cost rate would rise by 6.6 points to 80.91 percent. As a result, financial statements would show a net deficit for two years. In 2001, the net loss would reach 25 million pesos, and the sales profit rate would be a negative 1.5 percent. The business would go into the black in 2003.

For the ECs which are not in a financially sound position, purchase of 69 kV transmission facilities would entail an additional burden of borrowings amounting to 449 million pesos if made at the sound value price. This would be accompanied by a heavy burden of interest payments amounting to about 53.9 million pesos per year (at an interest rate of 12 percent). In other words, at any of the prices in question, takeover of the 69 kV transmission facilities from the NPC, the impact on profit and finances would clearly be considerably large and persist over the long term. In any case, genuine improvement of profits would not begin until around 2004.

9.4 High Probability of Improvement of Earning Power over the Long Term with Conversion into Joint-Stock Companies

At each EC, 5 percent of revenue is capable of use as reinvestment funds. Such assistance is liable to make management soft. It is important for the ECs to make self-help efforts for transformation from cooperatives into joint-stock companies. The state-run NPC is to be privatized within the next two or three years, and this will put pressure on the ECs to carry out programs of rigorous rationalization. In addition, it is impossible for cooperative organizations to raise funds externally. While management in the form of joint-stock companies is the premise, it would not be possible to raise outside funds, particularly through stocks, bonds, and long-term loans, unless the organization maintains earnings, executes efficient management, and is attractive to external investors.

However, management in the form of joint-stock companies would hold better prospects for

bringing rates down over the long term. This is because introduction of the competitive mechanism induces reduction of costs, as evidenced by past cases of privatization of state enterprises. Organizations that are capable of introducing rational management in the form of joint-stock companies should promptly do so.

Chapter 10: CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

The study team proposes transfer of the 69 kV transmission lines owned by the NPC on Leyte and Samar to a new cooperative established jointly by the 11 ECs especially for operation and management of these lines. The following prerequisites must be met for the execution of this option.

- All 11 ECs must participate in the new cooperative.
- There must be a clear demarcation of the 69 kV T/L assets. In addition, the ECs must negotiate with the NPC for adoption of the sound value as the transfer price.
- Tasks such as the formulation of business policy, construction of the organizational setup, and procurement of funds must be executed with the participation of all ECs.
- Modern Technology must be improved to ensure proper rehabilitation and maintenance after the transfer.

The study team also made a case study of the prospective transmission operation cost at the new cooperative.

While it would be realistic to defray this cost by borrowing from the NEA or a bank, this approach would keep the wholesale price in supply to the ECs higher than the delivery charge under the NPC unbundled tariff system up to and including 2005. As such, the ECs would have to pay more for power from the new cooperative throughout this period. One option for resolving this situation is transfer on a leasing contract or in 20-year installments.

Future estimates of the sub-transmission operation cost in each case

Unit: pesos per kWh

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Basic case: NPC delivery charge	0.14	0.15	0.16	0.17	0.18	0.18	0.19	0.20	0.21	0.22
A) Borrowing	0.25	0.24	0.22	0.21	0.20	0.18	0.17	0.16	0.15	0.15
B) Leasing	0.22	0.20	0.19	0.18	0.17	0.16	0.16	0.15	0.14	0.13
C) 20-year installments	0.09	0.09	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11
D) Borrowing (20-percent discount)	0.22	0.21	0.19	0.18	0.17	0.16	0.15	0.14	0.14	0.13

10.2 Recommendations

The study team made recommendations on the following items.

- 1) The ECs should establish an organ for conference in the period leading up to the establishment of the new cooperative in 2001. This organ would perform the tasks of transfer price negotiation with the NPC, formulation of business policy, and determination of the organizational setup. Beginning in 2001, the new cooperative must systematically maintain facilities and operate the business in a sound manner.
- 2) The price applied in the transfer of the 69 kV transmission lines should be based on the sound value. In preparation for the negotiations, the ECs must fully research all relevant matters and accumulate the requisite know-how.
- 3) Even the ECs with capital participation in the new cooperative should be transformed into joint-stock cooperatives in order to reinforce their constitution.
- 4) Full plans must be made and promoted for the training of technicians and improvement of the level of technology, for facility maintenance as well.
- 5) The NEA should consider the establishment of a training center to support such activities.
- 6) In connection with item 3) above, another study should be made toward the end of EC rationalization.

3)

4)

5)



