BPS TECHNICAL COMMITTEES

TC NO.	TITLE	NUMBER OF MEMBERS	ACTIVITY
1	Electrical Wires and Cables	11	
2	Fire Protection and Fire Fighting Equipment	9	
3	Cement and Lime	9	
4	Lamps and Related Equipment	10	
5	Concrete, Reinforced Concrete and Pre-Stressed Concrete		
6	Gas Cylinders		
7	Surface Active Agent	6	
8	Safety Matches and Lighters		
9	Batteries and Cells	7	
10	Electric Wiring Devices	9	
11	Steel	10	
12	Petroleum Products and Lubricants	8	
13			
14	Chemistry		
15	Fertilizers and Soil Conditioners	9	No
16	Rubber and Rubber Products	12	
17	Sizing System and Designation of Clothes		No
18	Textiles		No
19	Mechineries for Agriculture and Forestry		
20	Agricultural and Other Food Products	8	
21	Paper, Board and Pulps		
22	Lumber and Timber Products		No
23	Heating & Cooking Appliances	11	
24	Plastic Pipes and Fittings		
25	Paints and Varnishes		
26	Safety of Toys and Children's Playthings		
27	Leather		No
28	Glass and Glass Products	5	
29	Ceramic and Ceramic Products		
30	Household Appliances	7	
31	Pesticides		
32	Coal		No
33	Metal Casting		No
34	Doors and Windows		
35	Plywood and Veneer		No
36	Metallic Coatings		No
37	School and Office Supplies	5	
38	Hygienic Products		
39	Copper, Lead and Zinc Ores and Concentrates	10	
40	Packaging and Packaging Materials	9	
41	Furniture		
42	Tool and Die		No
43	Handicrafts		No
44	Road Vehicles	15	
45	Plastics and Plastic Products		
46	Water Pumps		No
47	Home Textiles		No
48	Infant Care Products	8	
49	Graphic Technology		
50	Fireworks	6	
51	Adhesives and Allied Products	7	
52	Quality Management and Quality Assurance	11	
53	Optics and Optical Instruments	8	
54	Jewellery	13	
55	Emvironmental Management	13	

LIST BY INTERNATIONAL CLASSIFICATION OF STANDARDS (ICS) FIELDS

13 Environment and Health Protection. Safety

Designation	Title
PNS 611-4:1991	Fire protection - Vocabulary Part 4: Fire extinction equipment
PNS 688:1992	Equipment for fire protection and fire fighting - Butterfly valves for fire protection service - Specification
PNS 689:1992	Equipment for fire protection and fire fighting - Graphical symbols for fire protection plans - Specification

17 Metrology and Measurement, Physical Phenomena

PNS 238:1989	Standard procedure for the verification, inspection and scaling of weighing scales
PNS 250:1989	Spring balances - Specification
PNS 399:1991	Preferred numbers - Series
PNS 400:1991	Guide to the use of preferred numbers and of series of preferred numbers
PNS 401:1991	Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers

19 Testing

PNS 146:1987	Qualification and certification of non-destructive testing personnel

21 Mechanical Systems and Components for General Use

PNS 153:1989	Metric fine screw thread - Specification
PNS 190:1989	Metric coarse screw thread - Specification
PNS 191:1989	Dimensions of width across flats
PNS 374:1991	Spur gears for general engineering - Shapes and dimensions - Specification
PNS 375:1991	Helical gears for general use - Shapes and dimensions - Specification
PNS 647:1990	Flat pulleys for flat transmission belts - Specification

23 Fluid Systems and Components for General Use

PNS 03:1983	Gas cylinders for liquefied petroleum gas (LPG) - Steel cylinders - Specification

7 Metrology and Measurement. Physical Phenomena

Designation	Title
PNS 890:1993	Horological vocabulary Part 2: Technico commercial definitions
PNS 553:1993	Standard test methods for Rockwell hardness and Rockwell superficial hardness of metallic materials
PNS 554:1993	Standard test method for Vickers hardness of metallic materials
PNS 617:1993	Standard test methods for tension testing of metallic materials (metric)
PNS 815:1993	Standard test methods for chemical analysis of steel cast iron, open-hearth iron and wrought iron
PNS 820: 1993	Standard test methods for optical emission spectrometric analysis of aluminum and aluminum alloys by the Point-to Plane technique
PNS 1243:1994	Optics and optical instruments - Spectacle frames - Vocabulary and lists of equivalent terms

23 Fluid Systems and Components for General Use

PNS 03:1992	Steel cylinders for liquefied petroleum gas (LPG) - Specification
PNS 26:1992	Steel-black and hot-dipped zinc-coated (Galvanized) longitudinally welded steel pipes (for ordinary uses) - Specification
PNS 41:1992	Liquefied petroleum gas (LPG) cylinder - Methods for requalification
PNS 661:1992	Organic chemicals - Plasticized polyvinyl chloride (uPVC) pressure pipes with elastic ring type joints - Minimum depths of engagement
PNS 711:1992	LPG cylinders - Method of repair
PNS 869:1992	Flat rolled steel products for welded gas cylinders - Specification
PNS 1070:1992	Determination of external loading characteristics of plastic pipe by Parallel-Plate Loading - Test method
PNS 1176:1993	Unplasticized polyvinyl chloride (uPVC) pipes - Specification and measurement of opacity
PNS 1200:1993	Single sockets for unplasticized polyvinyl chloride (uPVC) pressure pipes with elastic ring type joints - Minimum depths of engagement

ITDIのもつ標準

Table 2 INDUSTRIAL TECHNOLOGY DEVELOPMENT INSTITUTE

STANDARDS AND MEASURING INSTRUMENTS
1993.04.13

I. PRIMARY STANDARDS

PARAMETER	STANDARD	NOMINAL VALUE	UNCERTAINTY, ±	TRACEABILITY	DATE OF LAST CALIBRATION	DATE DUE FOR NEXT CALIBRTN
MASS	1 kg stainless steel	1 kg	0.3 mg	Calibration at CSIRO, Australia	1990	1995
	set of weights 31 pcs	1 mg - 20 kg	Equivalent to OIML Class E2	Calibration at NRLM, Japan	1990	1993
LENGTH	1 m line standard nickel steel	1 m	0.5 μm/m	Calibration at CSIRO, Australia	presently in CSIRO for calibration	
	set of gauge blocks	0.5 - 100 mm	0.05 μm to 0.10 μm	Calibration at CSIRO, Australia	1985	1990
	set of gauge blocks			Manufacturer's certificate	scheduled for calibration	
DENSITY	silicon density standards	2.329074 g/cm^3 2.329075 g/cm^3	0.000019 g/cm^3 0.000017 g/cm^3	NBS standard reference materials		
	set of standard hydrometers	0.600 - 2.000 g/m^3	0.0001 g/cm^3	Calibration at NRLM, Japan	1987	1992
VOLUME	calibrating buckets and proving tanks	500 mL - 20 L	3 x 10^{-4}	Mass and density standards	1992	1993

PARAMETER	STANDARD	NOMINAL VALUE	UNCERTAINTY,	TRACEABILITY	DATE OF LAST CALI-BRATION	DATE DUE FOR NEXT CALIBRTN
FORCE	deadweights	up to 4 tonf	1×10^{-5}	Mass standard & gravitational acceleration	1990	
	proving ring	90 tonf	0.03-0.25 tonf	Calibration at CSIRO, Australia	1990	1995
PRESSURE/ VACUUM	deadweights-piston tester	0-200 kgf/cm^2	0.1 %	Mass and length standards & gravitational acceleration	1988	1990
	deadweights-piston tester	0-2000kgf/cm^3	0.1%	Mass and length standards & gravitational acceleration	manufacturer's certificate	
	U-tube mercury manometer	up to 760 mm Hg	0.1 mm Hg	length standards	1986	1991
DC VOLTAGE	saturated standard cells in oven Elmeasco 700A-04	1 V	0.4 ppm	Calibration at CSIRO, Australia	presently in CSIRO for calibration	
DC RESIST-ANCE	Thomas type standard resistor L&N 4210	1 Ω	0.2 ppm	Calibration at CSIRO, Australia	1990	1995
	NBS Type standard resistor	1 kΩ	20 ppm	Calibration at CSIRO. Australia	1990	1991

PARAMETER	STANDARD	NOMINAL VALUE	UNCERTAINTY, +	TRACEABILITY	DATE OF LAST CALIBRATION	DATE FOR N CALIB
AC-DC TRANSFER	thermoelectric comparator Fluke 540B	1:1 transfer, 0.5 to 1000 V	0.005% to 0.05%	CSIRO, Australia	1990	1995
FREQUENCY	time base of counter HP5345A with high stability option	10 MHz (time base)	Aging rate: <3 x 10^{-7}/mo. <3 x 10^{-9}/1 s	VLF comparison with NWC transmission Australia	continuous	
TEMPERATURE	freezing point of water	0 °C	IPTS 68 Definition transition to ITS '90			
	tin	231.9681 °C				
	zinc	419.58 °C				
	indium	156.61 °C				
	aluminum	660.1 °C				
	copper	1083.00 °C				
	lead	327.43 °C				
	Pt-resistance thermometer	-180 to 630 °C	0.001 °C		presently in CSIRO for calibration	
	Pt-Rh thermo couples	0 - 1100 °C	1 + 0.07E µV	Calibration at CSIRO, Australia	1990	1995

II. SECONDARY STANDARDS AND COMPARATORS

PARAMETER	EQUIPMENT	RANGE	UNCERTAINTY, ±
MASS	precision balances	0 - 20 g	0.001 mg least reading
		0 - 100 g	0.01 mg least reading
		0 - 200 g	0.1 mg least reading
		0 - 3000 g	0.1 mg least reading
		0 - 50 kg	50 mg sensitivity
		0 - 60 kg	10 mg least reading
		0 - 100 kg	200 mg sensitivity
LENGTH	line comparator	0 - 1000 mm	0.005 mm
	gage block comparator	0 - 250 mm	0.03 µm
	universal measuring machine	0 - 500 mm	1 µm + 10 ppm of reading
	electronic micrometer	0 - 1.5 mm	0.3 µm
VOLUME	proving tanks	10 L to 500 L	0.05 %
FORCE	universal testing machine	0 - 50 tonf	0.1 %
HARDNESS	Vickers, Rockwell and Brinell measuring machines		
DC VOLTAGE	DC Standard Facility		
	a. Kelvin-Varley voltage divider, Fluke 720A	0 - 1000 V	5 to 10 ppm
	b. reference voltage divider, Fluke 750A	0 - 1, (1.1)	0.1 ppm linearity
	c. null detector, Fluke 845AR		
	d. DC voltage source HP 740B		
	K-6 Potentiometer Facility L&N 7556-a32	0 -16 mV - 1.6 V	0.0025 % to 0.0005 %

PARAMETER	EQUIPMENT	RANGE	UNCERTAINTY, ±
AC VOLTAGE	AC Calibrator HP 745A	0 - 1 mV - 100 V	0.02 %
	AC/DC Meter Calibrator HP 6920B	0 - 10 mV - 1000 V	0.2 %
AC CURRENT	AC/DC Meter Calibrator HP 6920B	0 - 10 uA - 10 A	0.4 %
RESISTANCE	L&N Reichsansalt & NBS type standard resistors	0.001 Ω to 1 MΩ	0.001 % - 0.002 %
	6-dial Wheatstone Bridge Facility L&N 4232-A31-B	0.1 Ω min to 11 GΩ max	0.005 % to 2 %
	7-dial Double Ratio Set Facility L&N 4398-M-A-31	1:11 to 11:1 0.1 mΩ to 100 kΩ	0.2 ppm
FREQUENCY	Universal Counter HP 5345A plus automatic frequency converter HP 5354A	0 - 4 GHz	time base stability <3 x 10^{-7} per month
	VLF/LF receiver/comparator Tracor 900A Carrier: 9.9 kHz - 25.6 kHz 59.9 kHz - 75.6 khz	1 MHz, 10 MHz	1 x 10^{-11} typical for one day period
	Frequency Difference Meter Tracor 527 E	100 kHz, 1 MHz, 2.5 MHz, 5 MHz	1 x 10^{-11}

PARAMETER	EQUIPMENT	RANGE	UNCERTAINTY, ±
TEMPERATURE	Industrial Platinum resistance thermometer Shimadzu, SRB	0 - 630 °C	0.01 °C
	Type R Thermocouple	0 - 1000 °C	1 μV + 0.07 % emf
	Mercury-in-glass thermometers, Yamato Scientific, 56-1 H-3	0 - 300 °C	0.1 °C
	Digital thermometer YEW 2572	K, S, R, T thermocouples -200 - 1370 °C	0.05 % + 0.3 °C
	mV potentiometer	10.1 mV - 100.1 mV	0.03 %
	oil bath	100 - 300 °C	0.1°C
	calibrating furnace	100 - 1000 °C	0.5 °C
DENSITY	hydrostatic balance for calibrating hydrometers and density determination	0.600 - 3.000 g/cm^3	0.0001 g/cm^3

エネルギー分野

ELECTRICITY SUB TRANSMISSION AND DISTRIBUTION SECTOR RATIONALIZATION

I. RATIONALE - NEED FOR CHANGE

The electric sector in the Philippines has undergone radical change since 1990. Generation, formerly the monopoly domain of the National Power Corporation (NPC), was opened to the private sector, both domestic and foreign. Enabling legislation was passed with broad public support. The introduction of the private sector into generation alleviated the crippling power supply shortfall. Restructuring plans for NPC, reflecting this significant diminution in their role, are well advanced.

In order to entice foreign investors into generation, it was necessary for the GOP to offer certain inducements to them. These inducements took essentially two forms. First, is the GOP guarantee of "take or pay" type contracts between the investor and NPC. In short, while the investor bears the risk of performance, he has a government backed, guaranteed market for the power he produces. Secondly, exchange rate and fuel supply risks (including fuel quality and availability) are backed by sovereign guarantees.

These sovereign guarantees preserve an unwanted role for the GOP in the sector. In more developed situations, the power supply agreements would generally be between the supplier of power and the distribution utility, with the sovereign's role being one of regulation. Only MERALCO is of sufficient stature to deal directly, without GOP guarantee, with independent power producers (IPP).

Under the Philippine Constitution, a "public utility" operating in the Philippines can be no more than 40% foreign owned. In the case of the electric sector, the definition of a utility is generally accepted to be an entity that sells power to more than one customer. IPP deals executed to date are not classified as public utilities as they sell to only one customer (NPC or MERALCO). The IPP corporations are majority foreign owned, and their commercial arrangements have been carefully crafted to avoid regulation by DOE and ERB.

There are clear indications that the GOP does not wish to continue to guarantee the commercial risks of the generation investors. This potential change in the risk sharing arrangements, coupled with the IPP's legal need to deal with only a single customer, will result in substantial commercial pressure on the electric distribution sector to consolidate their power demand in order to increase their attractiveness to the IPP community. The alternative is looming supply shortfall for unconsolidated distributors who will come to depend upon NPC's increasingly decrepit generation capabilities.

The Philippine electricity distribution sector, outside the National Capital Region (NCR), which is served by MERALCO, is comprised of Private Investor Owned Utilities (PIOU), 14 of which are of consequence, and 119 Electric Cooperatives (ECs). The PIOU's serve smaller urban areas outside the NCR, while the ECs can be generally characterized as small, marginally economic service providers, serving many low volume residential consumers. A number of ECs do serve urban areas with a much more viable customer profile. The sector could be rationalized if these distribution service providers could be grouped or federated into distribution utilities organized along technical and geographical boundaries. Such a rationalization could be expected to present a much stronger, more creditable market for IPP electricity. Such amalgamation of enterprises would also increase their aggregate ability to attract both new debt and equity funding.

There are significant impediments to corporate consolidation of distribution service territories; including (i) existing franchise holders enjoy substantial legal protection; (ii) EC requirements for consolidation include a positive vote of the membership; (iii) EC Boards of Directors have historically been loathe to vote themselves out of their positions; and (iv) the PIOU community would have to perceive strong financial incentives for a change in the status quo. Encouraging utilities to undertake joint operations (e.g., regional service companies) may encounter lesser resistance.

II. BACKGROUND

- Electric Cooperatives

NEA, using funds from World Bank, OECF, other bilateral donors, as well as their internal sources and GOP subsidies and grants, is spearheading a nationwide rehabilitation of the cooperative system and at least one PIOU (VECO). In all, more than one quarter of a billion USD will be injected into the rural electrification sector during this decade. This coordinated undertaking will address deferred maintenance of core systems, add on of economic customers, and upgrading of distribution systems to meet growing/shifting demand. Given present institutional arrangements and modest EC equity, this infusion of funds will bring many ECs to their practical borrowing limit.

Since inception, the EC sector participants, supported by NEA guidelines, have tended toward sub division of service territories that meet certain demographic and/or local citizenry participation criteria. EC consolidations have been few, and the benefits (e.g., economies of scale) resulting from those consolidations are difficult to quantify. The most recent example of an EC consolidation, whereby the three Albay cooperatives were combined into one, suggests that the potential benefits are modest, particularly when efficiencies made possible

through consolidation are not aggressively pursued. Occasionally, ECs have associated informally to undertake certain services on a joint basis, with some savings being realized from these efforts.

Although patterned after the USA model of distribution electric cooperatives, the Philippine version has higher customer density, but much lower levels of energy consumption. Financial rates of return have been lower. On average, the rural residential kwh usage in the USA is 20 times that of their Philippine counterparts. Moreover, in the USA, generation and transmission cooperatives and other regional technical service associations have been developed as mechanisms to support the viability of selected groupings of distribution cooperatives.

This disparity in consumer size, coupled with their power supply, technical support, and service operating environment, results in a large distribution "spread" between the bulk power supply cost and the retail tariff. This spread averages about 50% for USA cooperatives and slightly over 100% for Philippine ECs. The ECs and their consumers are thus locked in a vicious cycle; high tariffs, low consumption, excessive indirect costs, and marginal EC viability.

- Private Investor Owned Utilities

The 14 PIOU's outside the National Capital Region tend to be family owned service providers to the larger cities. These businesses have been operated on a for profit basis, with the needs of system upgrading, rehabilitation, and expansion balanced against the cash flow requirements of the investors.

In general, due to load characteristics, PIOUs are somewhat more commercially viable than their EC counterparts, although service reliability has been problematic for many of them as well. CEPALCO (Cagayan de Oro), Angeles Electric (Angeles City), and VECO (Cebu City) are all well run utilities that could exercise leadership in setting service standards in the sector. Although their solid performance is at least partly due to their more viable service territory (e.g., average sales per connection for PIOUs are three times that of the typical EC), there are indications that their profit orientation has led to greater efficiencies. Their commercial performance is noteworthy, particularly when considering that the PIOUs, unlike their EC counterparts, can avail of neither (i) tax exempt importation of material and equipment nor (ii) relatively low cost foreign loans, repayable in Pesos.

The PIOUs, with their for profit orientation, have shown little interest in expanding their franchise into rural areas comprised of low volume users, now served by ECs.

- National Power Corporation

NPC is under intense public scrutiny for its poor performance and its corporate credibility is low. Several bills have been introduced in the Philippine Congress to split NPC along regional lines, reflecting the momentum within the GOP and among the general public to restructure NPC. This regionalization of NPC, splitting the organization into a number of separate lines of business and geographic entities is considered inevitable.

As a part of this rethinking, NPC would like to transfer their sub transmission (69kV) lines and related facilities to the distribution sector. This transfer would also include those directly connected customers taking service below 5 MW (above that level, retail competition may be introduced). Although at one time the ECs managed (and built, in some cases) some of the sub transmission system, they were transferred to NPC in 1988, along with all gensets, for purposes of rate rationalization by the Government.

The low voltage lines and their attendant connections to existing loads are not technically optimal. Shifting patterns of existing and projected load growth indicate that upgrading and rationalization of the low voltage delivery system will need to be undertaken.

The feasibility of transferring ownership and operational responsibility of the 69kV sub transmission lines back to the distribution sector (where it technically belongs) is the subject of current discussion among sector participants. While NPC has clearly signalled that the sub transmission activity will not be a core undertaking for them, they will, by default, continue to operate these low voltage lines in the near term.

III. CONCEPTUAL DESIGN OF THE TECHNICAL ASSISTANCE

With the introduction of IPPs into the power supply structure, and the forecast that they will be the dominant source of generation in the near term, the electricity sector is in the midst of a radical reform. Although much remains to be assessed, it is clear that the distribution entities will be much affected by this change in source of supply and the new, private sector orientation to delivery of bulk power.

If the GOP ceases its market guarantees to new Purchase Power Agreements (PPAs), then the fragmented distributors will be under tremendous commercial pressure to aggregate their energy purchases into distribution or sub transmission customers attractive to private, and largely foreign, generation investors. In addition to securing reliable sources of power, the

electricity distributors, through reorganizing, would realize several benefits, including:

- enhanced ability to attract competent talent to address the critical managerial, technical, and purchasing needs of the distributors,
- ability to better manage demand, particularly management of the peak,
- economies of scale through reduction in utility overhead and staffing,
- reduction of distribution spread between the retail rate and wholesale power cost, and
- improved access to debt and equity financing.

Judging from past actions, it will be difficult to unilaterally induce any of the distribution service providers into consolidation with one or more of their neighboring systems, for, in addition to the economic concerns of potential combiners, there are also substantial political and legal barriers to such aggregations.

The recommended course of action is to (i) identify those groupings of distribution entities that recognize both the benefits and the imperative of aggregation (or federation) of service territories and (ii) assist them in realizing their organizational combination. There are ongoing initiatives, albeit in the very preliminary stages, for such aggregations in Northern Luzon, Northern Mindanao, Negros, Panay, and Cebu. In the case of Cebu, the three electric cooperatives, two PIOU's, and certain major consumers are actively discussing institutional arrangements which could lead to a rationalization of distribution, transmission and generation throughout the island. Key business and political leaders seem supportive of sector change.

A. Objective

The objective of the technical assistance is to (i) determine appropriate groupings of distribution entities in five selected pilot areas based upon technical, operational, and acceptability parameters; (ii) identify region specific approaches to aggregation; (iii) identify constraints to change; (iv) develop detailed action plans for the implementation of recommended alternatives, addressing: policy, legal, institutional, financial, and technical issues; and (v) assist the implementation of these institutional changes.

B. Proposed scope of work

1. Formation of the Steering Committee, Selection of study focus areas, and identification of counterparts

As this study should raise important issues related to key interest groups, major stakeholders should be represented from the outset. Representatives from (i) NEA; (ii) Energy Regulatory Board; (iii) EC Representatives; (iv) NPC; and (v) PEPOA; should join in forming a *Steering Committee* for the consideration and discussion of the issues which will emanate from this study. It is expected that the Steering Committee will be instrumental to the success of the project by their (i) knowledge of what is going on in the sector; (ii) advice on how to deal with the many impacted interest groups; and (iii) ability to effect needed sectoral reforms.

Through ongoing consultation with the Steering Committee and consideration of field survey findings, identify ongoing aggregation initiatives and review findings regarding technical groupings of distribution entities for study participation. Depending upon the type of arrangements likely to be favored by these groupings, large customers and/or potential equity investors and financing institutions may also be included. All forms of groupings should be studied thoroughly.

Counterparts for day to day interaction and support of the technical assistance team will be identified and mobilized from NEA and certain selected distribution entities. These counterparts will be given substantive roles in the study in order to (i) ensure maximum relevance and implementability of findings and (ii) promote technology transfer.

2. Development of detailed work plans

Following the establishment of the Steering Committee and the identification of study participants, prepare a detailed Work Plan highlighting (i) tasks to be performed; (ii) timing; (iii) outputs expected; and (iv) staffing pattern. The work plan should be action oriented, with a clearly defined catalyst role for the technical assistance team, leading to development of a comprehensive plan and subsequent implementation of institutional change. The work plan should be prepared within forty five days after project start up.

3. Survey of distribution utilities and customers

Systematic regional surveys of both distribution utility and customer needs, expectations, and interests will be performed early in the project to define each of the regional grouping areas. The surveys should be carefully crafted by experts, cleared in advance with the steering committee, and professionally carried out, in a statistically valid manner, so

that local, regional and national issues are brought to the fore for subsequent consideration.

Survey findings should be carefully considered by each of the assistance areas described below. Recommendations made and action plans developed should be crafted to address all areas of major concern highlighted by the survey.

4. Technical assessment - regional distribution optimization

Utilizing existing system maps of (i) the ECs; (ii) the PIOU's; and (iii) NPC, determine the most technically logical framework for distribution of electricity to current consumers. Make an assessment of technical implications for projected future load growth, using the forecasts developed by existing sector participants. This phase of the work should address:

- Reconfiguration of the existing system needed in order to more logically serve existing and projected loads, with particular attention directed to the placing of future delivery points,
- Rehabilitation needs,
- Projected costs of ongoing operation and maintenance, and
- Personnel and equipment needs to capably manage and operate the sub transmission lines.

Identify changes needed to rationalize the transmission and sub transmission systems and related facilities and prepare maps highlighting major construction schemes needed. Prepare cost estimates in support of recommendations. Assess the capability of existing distribution service providers to undertake the technical rationalization scheme proposed.

Prepare an action oriented task timetable and responsibility chart for the assumption of NPC sub transmission facilities. Also, identify distribution technical support service shortcomings (e.g., engineering, construction, procurement, maintenance, and training) for each region being studied and prepare approaches to overcome these deficiencies.

5. Institutional assessment - regional distribution optimization

Through (i) discussions with current sector participants; (ii) consultations with the Steering Committee; (iii) consideration of the technical realities; and (iv) thorough analysis by the technical assistance team, prepare *region*

specific recommendations for institutional arrangements for the distribution sector. These recommended arrangements must address:

- organizational form(s) for the rationalized distribution entities,
- likely source of competent management to operate the newly formed entities,
- human resource training required to ensure organizational effectiveness,
- role of foreign investment, including consideration of management contracts,
- acceptability to current stakeholders,
- policy and legal framework, including the roles identified for NPC, ERB, NEA, SEC, and CDA,
- tariff, tax and regulatory issues, and
- barriers to implementation.

6. Financial assessment - regional distribution optimization

It is likely that the technical groupings and institutional organization recommendations for the rationalized distribution of power will require substantial investment to implement. The technical assistance team, working in close coordination with the Steering Committee, should develop financing strategies for the funding of the recommended rationalization scheme.

This will require a creditworthiness review of current sector stakeholders and a critical assessment of their financial capabilities to participate in the rationalized scheme. The rules of the Cooperative Development Authority (CDA), including existing legal mandates impacting the ECs, should be carefully considered, including the applicability of the stock cooperative concept.

With regard to the desired turnover of the existing, NPC owned and maintained, low voltage transmission system in the regions, analyze and consider the implications of:

- NPC's cost basis in the 69kV system and their desired transfer price, terms, etc.,

- Terms, conditions, and remaining balances on associated loans (particularly foreign) and their assumability,

- Wheeling charges for sub transmission services which are (or could reasonably be expected to be) permitted by ERB, and

- Proposed NPC tariff revisions to permit meaningful competition for customers taking service above an agreed load threshold (current cross subsidies and tariff structures preclude non NPC service of directly connected consumers),

The financial analysts should prepare a detailed report which includes: (i) financial projections addressing each of the issues raised above in several possible scenarios and (ii) the financial implications of the combined distribution entity and the impact on retail tariffs and distribution spread. The investment banking expert should prepare a clear financing strategy in support of the projections which are developed.

7. Legal assessment - regional distribution optimization

There will need to be an assessment made of:

- national laws impacting the sector, including those regulating the equity investment by foreigners in utility operations,

- proposed power supply contracts,

- local legal barriers to rationalization,

- existing activity charters, policies, and by laws, and

- existing debt agreements and covenants

This portion of the technical assistance should also provide assistance in the drafting of any proposed legislation.

One of the major barriers to system consolidation is the requirement of EC consumer members to approve any system consolidation or sale. The surveys performed in three above should address consumer members, employees, and Board member attitudes in this regard and should suggest the approach to be taken in order to promote functional aggregation of the regional participants.

8. Development of master plan for distribution utility consolidation based on (i) the location of delivery points, and (ii) projections of load growth.

C. Staffing

This will be a very high visibility undertaking, potentially resulting in major structural changes to the distribution sector. It is essential that the technical assistance team be composed of highly qualified professionals whose judgment and experience will (i) be respected by the Steering Committee and (ii) facilitate acceptance of the resulting recommendations by the many stakeholders in the sector.

Key staff would include:

Expatriate

Project Coordinator:	An recognized expert in electric utility institutional change (cooperative and Philippine experience a plus) consensus building, and utility restructuring is needed. He/she must also be acceptable to the existing stakeholders, as institutional recommendations are likely to be controversial.
Power Engineer	A Transmission and Distribution Engineering expert with meaningful developed country and Asian electric distribution utility experience without ties to existing construction of distribution facilities including Sub transmission lines, should lead this technical effort.
Investment Banker/ Financial Analyst	An expert knowledgeable of power sector financing needs and investor expectations, with solid credentials in developing country restructuring experienced and in assessing and analyzing distribution utility operations.

Local Staff

Financial/Accounting:	Local accountants and financial analysts knowledgeable in utility accounting and rate matters should prepare the financial support to all technical and institutional recommendations developed during the study
Technical:	A local engineering firm should assist and provide logistics arrangements (office space, plotters, CAD, etc.) for the expatriate technical expert.
Legal:	A local, highly respected, and credible law firm, free of any obvious political bias, should take the lead in this area. To the extent that facilitating legislation needs to be drafted, a foreign expert, with established credentials, may be a desirable addition to the local legal team.
Field Surveyors:	A reputable field survey professional and team from a consulting group or university

D. Level of Effort

STAFF POSITION	MAN MONTHS
EXPATRIATE:	
Project Coordinator	12
Power Engineer	12
Investment Banker/Financial Analyst	8
Local Staff:	
Financial/Accounting	18
Technical	18
Legal	6
Field Surveyors	12
Man month totals	86

12

DRAFT ONLY

June 9, 1995

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_____
_____

Gentlemen:

Subject: Feasibility Study on Electricity Sub-Transmission and Distribution Sector Rationalization

1. You are hereby invited to submit a proposal for technical assistance services required by the NEA in the feasibility study on electricity sub-transmission and distribution sector rationalization which could form the basis for future negotiations and ultimately, a contract between your firm and NEA.

2. The National Electrification Administration has received funding from the World Bank and intends to apply some of these proceeds to eligible payments under the contract for which this invitation for proposal is issued. NEA will be the executing agency.

3. The main objectives of the assignment are as follows:

   (i) Determine appropriate groupings of distribution entities based upon technical, operational, and acceptability parameters;

   (ii) Identify site specific approaches to aggregation;

   (iii) Identify constraints to change;

   (iv) Develop detailed action plans for the implementation of recommended alternatives, addressing: policy, legal, institutional, financial, and technical issues; and

   (v) Assist the implementation of these institutional changes.

4. In order to obtain first-hand information on the assignment and the local conditions, it is considered desirable that a representative of your firm visit NEA before the proposal is submitted. Your representative should meet:

Mr. Leonardo R. Olano
Deputy Administrator for Technical Services
National Electrification Administration (NEA)
Quezon Avenue, Quezon City
Philippines

5. To enable you to submit proposal, please refer to the attached Terms of Reference (TOR).

6. Proposals will be evaluated based on the following criteria:

CRITERIA	WEIGHT
Experience of Firm	
Experience in international projects of comparable size, complexity and technical specialty.	10 %
Experience in developing countries under comparable conditions.	10 %
Proposal	
Approach and Methodology	15 %
Work Plan (including staffing schedule)	15 %
Personnel	
General qualifications	20 %
Adequacy for the assignment	20 %
Price	10 %
Total	100 %

7. Proposal should include financial details. The financial proposal should show the cost for both local and expatriate advisors and the budget should be broken into foreign and local currency components.

8. Foreign firm may associate with a domestic firm. Please note that a domestic firm may only associate with one foreign firm on the invited list.

9. You are requested to hold your proposals valid for 90 days from the deadline date of submission, during which time you will maintain, without change, (i) the personnel proposed for the assignment and (ii) both the rates and total price proposed. NEA will

make its best effort to evaluate your proposal within this period.

10. Please note that the cost of preparing a proposal and negotiating a contract, including trips to the Philippines, is not reimbursable as a direct cost of the assignment.

11. Assuming that the contract can be satisfactorily negotiated during July, 1995, you will be expected to commence the assignment in August, 1995.

12. An invitation to submit proposals has been sent too, to the following firms:

    a)

    b)

    c)

13. Three copies of your completed proposal should be delivered to the PBAC, National Electrification Administration, 5th Floor, D & E Building, Quezon Avenue, corner Roces Street, Quezon City, Philippines on or before 10:00 A.M. of February 13

14. NEA is not bound to accept the proposal submitted.

15. Please inform us by facsimile of the following:

    (a) your receipt of this letter o invitation

    (b) within five days, whether you will be submitting a proposal and when; and

    (c) the date and mode of shipment when submitting a proposal.

Very truly yours,

TEODORICO P. SANCHEZ
Administrator

MP 1013 ½

25.Sep.95

To whom it may be concerned of National Electrification Administration

JICA Project Formulation Study Team will visit the Philippines in order to inquire into the viability of a Development Survey Study which is titled "Feasibility Study on the transfer of Facilities and Management of the 69KV Transmission Lines and Systems from the National Power Corporation to the Electric Cooperatives", and formulate it to be suitable to JICA's Development Survey Scheme.

In this regards, we would like to know the following basic information prior to our arrival in your country for advance analysis.

1.Reason why Rural Electric Cooperatives(RECs) below were excluded from rehabilitation program of under 69KV subtransmission lines and facilities which are now under implementation among other 22 RECs.

Panay Grid:PECO , AKELCO , ILECO II

Negros Grid:CENECO , NOCECO

Ceb Grid:VECO

Leyte Grid:LEYECO VI

2.If above RECs need the rehabilitation, do you expect the Study to include them?

3.We are recognizing the study area to be under 69KV transmission lines and facilities (including 69KV) however, we would like to know more precise range of the study area.

Your quick reply will be highly appreciated, and we are looking forward to having a fruitful discussion with you.

Sincerely yours,

Takeshi NARUSE

The leader of Project Formulation Mission of JICA

I. Reason why Electric Cooperatives (ECs) below were excluded from the rehabilitation program of under 69KV subtransmission lines and facilities which are now under implementation among 22 ECs.

- Foremost, the Panay Electric Company (PECO) and the Visayan Electric Cooperative, Inc. (VECO) are private franchises, outside the jurisdiction of NEA. The remaining 5 ECs (AKELCO, ILECO II, CENECO, NOCECO AND LEYECO V) were not considered due to the fact that priority was given to those ECs which have rehabilitation projects listed as their priority.

II. If above ECs need the rehabilitation, do you expect the Study to include them?

- No. Above ECs are subsequently included in RERP (IBRD) LOAN and REEP (OECF) LOAN.

III. We are recognizing the study area to be under 69 KV transmission lines and facilities (including 69 KV) however, we would like to know more precise range of the study area.

- The study shall specifically cover the 69 KV transmission lines and related facilities only.

12.Oct.95

To whom it may be concerned of National Power Corporation

JICA Project Formulation Study Team will visit the Philippines in order to inquire into the viability of a Development Survey Study which is titled "Feasibility Study on the transfer of Facilities and Management of the 69KV Transmission Lines and Systems from the National Power Corporation to the Electric Cooperatives", and formulate it to be suitable to JICA's Development Survey Scheme.

In this regards, we would like to know the following basic information, so please prepare the answer to them by our visit.

1.Actual state and problems in maintenance and operation of NPC owned 69KV transmission lines and facilities in recent years:

(Ⅰ) blackout accidents

(Ⅱ) restoration works

(Ⅲ) employed workers

(Ⅳ) financial conditions

(Ⅴ) system of responsibility

2.How do you deal with problems stated above?

3.What kind of future plans do you have ?

4.Are you going to finish the rehabilitation of the 69KV transmission lines and facilities by the time you transfer it to RECs?

Sincerely yours,

Takeshi NARUSE

The leader of Project Formulation Mission of JICA

REPUBLIKA NG PILIPINAS
Pambansang Korporasyon Sa Elektrisidad
(NATIONAL POWER CORPORATION)

LSPD-TPD-95257
November 9, 1995

Mr. Takeshi Naruse
Leader-Project Foundation Mission
Japan International Cooperation Agency
12th Floor, Pacific Star Bldg., Sen. G. Puyat Ave. Ext.
Corner Makati Avenue, Makati City

Dear Mr. Naruse :

With reference to your questionnaire dated October 12, 1995, we wish to inform you of the following :

1. a. NPC's 69 KV-facilities are operated and maintained by Area Managers in cooperation with the Technical Services Departments (TSD) who provide support for equipment repair, metering and protection calibration. These groups report to the Manager of the Power Transmission Group (PTG), who in turn, reports directly to the Regional Vice-President. Note that the Area Managers are usually in-charge of at least one major bulk substation which serves a province and other adjacent areas.

   b. Based on our experience, blackout incidents are relatively higher for most 69 KV subsystems due to the following reasons :

   - These transmission lines are built with wood-pole structures which are less durable than steel poles or towers

   - Most customers are radially fed through main or lateral feeders with limited or no alternative facilities for load transfer during contingencies or maintenance outages.

   c. Restoration and repair works for 69 KV facilities are performed by Area Managers with the help of the PTG of the region concerned.

   d. For NPC's financial/operational performance and other relevant organizational information, enclosed is our 1994 Annual Report for your information.

   e. Redundant facilities and use of more durable steel-pole and towers for 69 KV facilities are not economically viable due to the relatively low demand and slower growth rate in the rural areas where these facilities are utilized.

2. Service interruptions due to maintenance outages are closely coordinated with affected customers so they can make the necessary adjustments in their activities.

3 Expansion planning in NPC is highly centralized although regional offices are consulted on the future requirements of their 69 KV sub-systems. Some additions of 69 KV facilities are initiated in coordination with the National Electrification Administration as requested by concerned government agencies or new customer applications.

Office Address:
Cor. Quezon Avenue & Agham Road
Diliman, Quezon City
P.O. Box 10183

Cable Address
NAPOCOR PM
Telex: 40120

Tel. Nos.
92-13-541 571
551 580
561

Attached for your information is the list of the proposed 69 KV transmission projects included in the latest Power Development Program of NPC.

4. There are no major rehabilitation programs being planned by NPC for its 69 KV system inasmuch as restoration and repair works are performed regularly by the Area Managers. Further, major rehabilitation works for its 69 KV system shall not be undertaken pending resolution of voltage levels applicable for NPC power service delivery to its direct customers.

Very truly yours,

G. A. A. DELGADO
President

Encl. : a/s

12.Oct.95

To whom it may be concerned of National Electrification Administration

JICA Project Formulation Study Team will visit the Philippines in order to inquire into the viability of a Development Survey Study which is titled "Feasibility Study on the transfer of Facilities and Management of the 69KV Transmission Lines and Systems from the National Power Corporation to the Electric Cooperatives", and formulate it to be suitable to JICA's Development Survey Scheme.

In this regards, we would like to know the following basic information, so please prepare the answer to them by our visit.

1.Task allotment between the Organizations of the Philippines Electric Power Agencies for supervision, guidance and administration.

(Ⅰ) Correlation between DOE,ERB,PNOC,NPC,NEA,REC,PEU

(Ⅱ) Relations between NEA and RECs

2.Outline of power distribution and generation and communication facilities owned by RECs and introduction to ongoing projects and mid and long-term projects based on the projection of future demands.

3.Actual state and problems in maintenance and operation of RECs in recent years:

(Ⅰ) blackout accidents

(Ⅱ) restoration works

(Ⅲ) employed workers

(Ⅳ) financial conditions,

(Ⅴ) system of responsibility

4.Actual state of recent investment from official foreign agencies and their objectives, contents of projects and their state of progress.

5.Budget allocation necessary for administration and maintenance, cost calculation method at RECs, purchase price of electricity and its relation with power rates, and an issue regarding who collects the electricity charges from the general and bulk consumers?

6.Does NEA or RECs carry out the planning , design, and construction of and procurement of materials for facilities?

7.What plans are being carried out regarding the employment, education and training of the NEA and RECs employees and engineers?

8.What standards are applied to the design and execution of the construction work of electric work piece?

9.Policy on Rural Electrification:
Status of Electrification Cooperatives; are electrification cooperatives owned by a rural government or central government?

10.How is the ownership of facilities separated between NPC and NEA?
If the 69KV facility is transferred, is the ownership of transformer substations, transmission lines (of high voltage, or of low voltage) and communication facilities planned to be separated from the NPC rural electrification cooperatives?

11.What is the current supervision system and its state of supervision?
Supervision of transmission lines mainly means making inspection works as far as the hardware is concerned, and taking such action to alter transmission supply routes by manipulating machinery at each substation in order to switch transmission line system upon accidents and/or troubles as far as the software is concerned?

12.Data of the investment effect and its valuation regarding transmission loss reduction, improvement of efficiency for bulk consumers, voltage drop reduction, frequency variation reduction and improvement, and load factor improvement, etc.

13.According to the NPC's long-term plan, in 2005 the Visayas area is planned to have electric energy and maximum electric power approximately three times as large as the current level. Under such circumstances, please provide the full contents of the following requests to be made to Japan upon transfer of NPC's 69KV transmission and transformation facilities.

(i) Necessary Fund (countermeasure to Reduce Transmission Loss) Reinforcement and expansion work of 69KV transmission, transformation and communication facilities in conjunction with
demand increase.

(ii) Rehabilitation (of Transmission, Transformation and Communication Facilities)

(iii) Possibility of dispatching technical experts of power transmission, distribution and communication, and acceptance of trainees. (Assistance in material and fund supply in conjunction with establishment of a training center)

(iv) Establishment of a network through the completion of the communication network in conjunction with organizational unification and informationization of power receiving system accompanying the privatization of NPC.

Sincerely yours,

Takeshi NARUSE

The leader of Project Formulation Mission of JICA

1. Task allotment between the organizations of the Philippines Electric Power Agencies for supervision, guidance and administration.

(i) Correlation between DOE, ERB, PNOC, NPC, NEA, REC, PEU

(ii) Relations between NEA and ECs

INSTITUTIONAL LINKAGES :

The Philippine Energy Sector is an aggrupation of government and private entities for planning and implementing a unified national energy program and providing common propositions to present concerns.

a. **Department of Energy (DOE)** - tasked to ensure a continuous, adequate and economic supply of energy with the end in view of ultimately achieving self-reliance in the country's energy requirements. The DOE shall prepare, integrate, coordinate, supervise and control all plans, programs, projects and activities of the Government relating to energy exploration, development, utilization, distribution and conservation. The Philippine National Oil Company (PNOC), the National Power Corporation (NPC) and the National Electrification Administration (NEA) are attached agencies of the Department.

b. **Philippine National Oil Company (PNOC)** - a government corporation, PNOC is tasked with energy exploration functions as well as downstream activities from oil refining to distribution.

c. **National Power Corporation (NPC)** - carries out the power generation and transmission activities and sells power to electric distribution utilities and large industries on wholesale basis. The National Power Corporation (NPC) is responsible for the national transmission grid which includes most transmission systems nationwide.

d. **National Electrification Administration (NEA)** - functions as a financial intermediary primarily for the promotion of rural electrification through the 119 Electric Cooperatives (ECs) operating nationwide. Moreover, NEA provides technical assistance to the ECs to ensure their operational viability. As per its mandate, the NEA Board of Administrators is empowered to convert itself into a commission, the National Electrification Commission, (NEC) which has the authority to grant franchise for

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To MIMA B.	From ROD PADUA
Co. JICA	Co. NEA
Dept.	Phone # 99-61-44
Fax # 816-4222	Fax #

electric distribution and regulate the electricity tariff charges of the ECs. NEA's rate fixing powers have been transferred to the Energy Regulatory Board (ERB) for consistent application of electric tariffs. NEA however, continues to review ECs' rates, prepares recommendations on appropriate rates and attends public hearings as intervenor/respondent.

e. **Electric Cooperatives (ECs)** - they are the implementing arm for the Rural Electrification program. NEA provides financial and technical support to the ECs, for their expansion, rehabilitation and other programs through grants/subsidies and long-term loans; monitors their operations; regulates electricity rates and supervises technical and managerial activities.

f. **Energy Regulatory Board (ERB)** - a quasi-judicial body, ERB is an independent body which is empowered with rate regulation functions for private utilities as well as other petroleum products.

g. **Philippine Rural Electric Cooperative Association (PHILRECA)** - the association of the 119-member electric cooperatives. The PHILRECA entered into a Memorandum of Cooperation with the NEA to explore all possible areas of cooperation and collective action for the benefit of the ECs.

h. **Private Electric Utilities (PEUs)** - the NEA/NEC registers and gives franchise permits to private electric utilities who wish to serve unenergized areas. Likewise, the private utilities secure a certificate of franchise from the NEA/NEC to be able to expand its service to areas already covered by the ECs.

2. **Outline of power distribution and generation and communication facilities owned by RECs and introduction to ongoing projects and mid and long-term projects based on the projection of future demands.**

At present, 154,830 circuit kilometers of distribution lines are already in place. The total system installed capacity is 1,985 MVA with a national peak demand of 903 MW and a load factor of 61.72 percent. To cope with the projected increase in demand, 285 MVA of various capacities/rating are planned for installation.

3. **Actual state and problems in maintenance and operation of ECs in recent years:**

(i) blackout accidents
(ii) restoration works
(iii) employed workers
(iv) financial condition
(v) system of responsibility

In 1994 alone, an average of 52 hours of service interruptions were experienced by the ECs. This can be attributed to poor maintenance of electrical/line equipment, unmaintained right-of-way clearing, and insufficient logistical equipment and proper technical training.

4. **Actual state of recent investment from official foreign agencies and their objectives, contents of projects and their state of progress.**

NEA's achievements have resulted in the improvement of its image here and abroad. Consequently, NEA regained the confidence of foreign financing institutions which have agreed to finance NEA's Medium-Term requirements. Loans and financing programs negotiated were:

a. World Bank Energy Sector Project. This project includes improvement of NEA's institutional capabilities and functional capacity, upgrading and repair of distribution systems, installation of additional substations, trainings, technical assistance amounting to US $22.3M, financed by the International Bank for Reconstruction and Development (IBRD). The National Government shall consider this amount as an equity contribution to NEA once the increase in capitalization is approved by Congress. There are 24 beneficiary ECs from this project. A total of P589 M has been approved as loan to 24 beneficiary ECs.

b. World Bank RE Revitalization Project (RERP). A loan in the amount of US $91.3 M was extended by the IBRD directly to NEA for the implementation of this project. The objectives are enhancing NEA's capability to function as core agency for the sector, encouraging operational and financial reforms among the ECs and improving the reliability of electricity supply in the rural areas by financing a portion of their 1992-1995 investment

program, and providing technical and training for NEA and ECs. There are 54 beneficiary ECs from this project.

c. USAID Grant. This US $40 M package from the Unites States Agency for International Development includes technical assistance, training and commodity to assist NEA and the ECs in strengthening their institutional capacity and to upgrade the physical infrastructure of the ECs to ensure its commercial viability. It also involves the preparation of the Rural Electrification Master Plan. Recipients of US$ 410,000 each under the Commodity Package (COMPAC) I are some 23 ECs, while 12 ECs are recipients of US$ 120,000 each under the COMPAC II. Expected completion date is December 31, 1995.

USAID also granted $8.2 M for the computerization program of both NEA and the ECs. Installation of the Local Area Network (LAN) system is 95% complete. Information technology support has been provided to ECs similar to the pilot testing of the Enhanced Electronic Billing System (EEBS) in CEBECO II and CEBECO III and assistance to EEBS hardware and software problems.

d. Wood Pole Project. The Wood Pole Project was undertaken through a bid with financing scheme, and the contract was awarded to Edison -Hubbard with Eximbank financing and coursed through Chase Manhattan Bank. The project calls for the supply of wooden poles amounting to US $21.9 M. The loan negotiation with the bank took place in April 1992.

e. Steel Pole Project. The project involves the purchase of steel poles and related accessories amounting to Canadian $36.21M. This is being financed through a 35% grant from the Canadian International Development Agency (CIDA) and a 65% export credit from the Canadian Export Development Corporation (EDC). Project agreements with these agencies were signed in December 1991.

f. Philippine-German Special Energy Program (GTZ-SEP). The Philippine-German Special Energy Program is a bilateral cooperation program being undertaken by the Philippine Government and the Federal Republic of Germany. The NEA and GTZ are the agencies charged to implement the program for the two countries.

The project intends to emphasize the refinement and replication of the best model for Rural Photovoltaic Electrification (RPE). It also includes completion and evaluation of ongoing mini-hydro projects and provides appropriate assistance for NEA's mini-hydro activities. SEP activities are scheduled for NEA take-over by 1996.

g. OECF Rural Electrification Extension Project (REEP). This project is included in the 18th Yen Loan Package and involves the rehabilitation, add-ons and expansion of distribution lines and necessary support facilities of 45 ECs and the Visayan Electric Company (VECO). Supervision project services and other consultative services are included in this package. The total project cost amounts to US$92.2 M, of which US $80.7 M is intended for the ECs and US $11.5 M for VECO.

5. **Budget allocation necessary for administration and maintenance, cost calculation method at ECs, purchase price of electricity and its relation with power rates, and an issue regarding who collects the electricity charges from the general bulk consumers?**

COST CALCULATION METHOD OF ECs

Presently Electric Cooperatives use the Cash Flow Methodology in calculating its rate using the following basic cost components:

I. POWER COST - It is the cost incurred in the purchase of power (whether from the National Power Corporation or other sources).

II. SYSTEM LOSS - It is the cost of power which is lost in the process of distribution to the end consumer caused by either technical or non-technical factors (pilferage).

III. NON-POWER COST - It is the cost of operating and maintaining the electric distribution system (i.e. office supplies, employees salaries, etc.)

There are 4 Classifications of Non-Power Cost namely:

1. Distribution Expense - Operation
2. Distribution Expense - Maintenance
3. Consumers Account Expense
4. Administrative and General Expenses

IV. **AMORTIZATION COST** - It is the cost incurred in the payment of principal and interest on loans of the ECs granted by NEA.

V. **REINVESTMENT COST** - It is intended to generate funds from operation to partly finance the increasing portion of ECs capital expenditures for rehabilitation and expansion consisting specifically of labor cost, hauling, installation, clearing, etc.

OTHER ADJUSTMENTS

In addition to the basic cost components enumerated above, ECs are authorized to charge consumers other adjustments consisting of NPC variable charges like the Fuel Purchase Cost Adjustment (FPCA), Foreign Exchange (FOREX) etc. and the mandated wage increases by virtue of its Power Cost Adjustment (PCA) and Wage Adjustment (WA) Clause.

The PCA clause is not actually aimed at realizing any mark-up but basically to recover the increase in power cost and system loss incurred in the process of distribution while the WA is aimed to recover the wage increases mandated by law. Republic Act No. 7638 or the Department of Energy Act, transferred the rates-fixing function of the ECs to the Energy Regulatory Board effective December 28, 1992, who decided to temporarily adopt the Cash Flow Methodology used by the ECs.

PURCHASE PRICE OF ELECTRICITY AND ITS RELATION WITH POWER RATES

On the average, the percentage cost allocation of each component to the ECs' total rate is 51% for power cost; 11% for system loss; 22% for non-power cost; 11% for amortization and the remaining 5% for reinvestment cost.

ISSUE REGARDING WHO COLLECTS THE ELECTRICITY CHARGES FROM THE GENERAL AND BULK CONSUMERS

Generally, residential, commercial, small industrial consumers, etc. are served by the ECs or the Private-investor-owned Utilities(PUs). These distributors collect electricity charges from these general consumers. However, bulk consumers (big industries) are either served by the ECs, PUs or NPC. Based on the data we gathered, 51 big industries within the ECs and PUs franchise areas are directly tapped or being served and billed by NPC. All other big industries are connected to the ECs or the PUs. ECs tariff structure basically aims to recover the cost of providing electric service without any profit, therefore, non-recovery of these adjustments will result in the ECs' financial deficiencies which could jeopardize their viability and service efficiency. It is for the ERB to affirm whether they will continue using this methodology.

6. **Does NEA or ECs carry out the planning, design, and construction of and procurement of materials for facilities?**

   - While both NEA and the ECs carry out the planning and design of the system, the actual construction is being implemented by the ECs, in close supervision of NEA personnel. Procurement of foreign materials is being undertaken at NEA Central Office while line materials of local origin is procured by the ECs.

7. **What plans being carried out regarding the employment, education and training of the NEA and RECs employees and engineers?**

   - The education and training programs for NEA and EC employees and engineers encompass the following categories:

   a. Institutional Development
   b. Financial and Management Trainings
   c. Executive Development Programs
   d. Technical/Skills & Craft/Electrical Trades
   e. Educational (Graduate/Post Graduate)

8. **What standards are applied to the design and execution of the construction work of electric work piece?**

- The ECs prepare an annual workplan for approval by NEA. Subject to availability of funds, the ECs will then submit a budget request for the project for NEA evaluation and costing. NEA standards for construction are imposed on all force account projects.

9. **Policy on Rural Electrification: Status of Electrification Cooperatives; Are electric cooperatives owned by a rural government or central government?**

- Electric Cooperatives are non-stock, non-profit organizations that are owned by member-consumers, however, funding for its projects are sourced thru government funds.

10. **How is the ownership of facilities separated between NPC and NEA?**

If the 69 KV facility is transferred, is the ownership of transformers substations, transmission lines (of high voltage or of low voltage) and communication facilities planned to be separated from the NPC rural electrification cooperatives?

- All facilities that pertain to the generation of power are owned and operated by NPC. There are some instances wherein NPC still owns smaller-capacity substations. In all cases, however, the ECs distribute power. Moreover, there is an existing NPC policy which states that these substations be leased to ECs for a certain period of time. If and when the transmission line will be transferred, all the said substations, communication and other facilities must subsequently be transferred to the ECs.

11. **What is the current supervision system and its state of supervision? Supervision of transmission lines mainly means making inspection works as far as the hardware is concerned, and taking such action to alter transmission supply routes by manipulating machinery at each substation in order to switch transmission line system upon accidents and/or troubles as far as the software is concerned?**

Since NPC owns all existing 69 KV lines, supervision, maintenance, and line rerouting are carried out by them.

12. Date of the investment effect and its valuation regarding transmission loss reduction , improvement of efficiency for bulk consumers, voltage drop reduction, frequency variation reduction and improvement, and load factor improvement, etc.

No data available as of to date.

13. According to the NPC's long-term plan in 2005 the Visayas area is planned to have electric energy and maximum electric power approximately three times as large as the current level. Under such circumstances, please provide the full contents of the following requests to be made to Japan upon transfer of NPC's 69 KV transmission and transformation facilities.

(i) Necessary fund (countermeasure to reduce transmission loss) reinforcement and expansion of 69 KV transmisison, transformation and communication facilities in conjunction with demand increase.

(ii) Rehabilitation (of transmission, transformation and communication facilities)

(iii) Possibility of dispatching technical experts of power transmission, distribution and communication, and acceptance of trainees. (Assistance in material and fund supply in conjunction with establishment of a training center)

(iv) Establishment of a network through the completion of the communication network in conjunction with organizational and unification and informationization of power receiving system accompanying the privatization of NPC.

- The 69 KV transmission lines have been in-place for quite sometime and rehabilitation and reinforcement procedures are necessary for those areas experiencing the effects of perennial natural calamities. The availability of line/timber materials, sufficiency of manpower compliments and logistics definitely contribute a lot to the reliability of power. Since substation capacities of 210 MVA have just been realized, consequently, the ECs will have to expand/construct additional 69 KV transmission lines.

apd3:\jicasurv

TITLE: A Project Proposal for Development Survey Assistance Program in the Preparation of a Master Plan for Coal Utilization

IMPLEMENTING AGENCY: Government of the Philippines
Department of Energy (DOE)
Conventional Energy Division

SUPPORTING AGENCY: Government of Japan
Japan International Cooperation Agency (JICA)

PROJECT DURATION: Eight (8) Months

BACKGROUNDER:

Considered as an essential element of the Philippine energy plan towards achieving a self-reliant energy sector is the establishment of programs directed at encouraging the use of our indigenous energy resources. In pursuit of this objective, a massive coal conversion/utilization program was initiated by the government following the world oil crisis in 1973.

This led to the issuance of Letter of Instruction 1094 which compelled cement plants to convert from oil- to coal-firing. It was followed by a series of directives, which included Presidential Decree 972, "The Coal Development Act of 1976," providing economic incentives to industries that patronage coal, and Executive Order 1722, establishing the National Coal Authority (NCA).

The NCA was tasked with ensuring the sufficient supply of coal by regulating activities related to the supply and distribution of the resource. Among the measures the NCA implemented to support the local coal industry was the one-channel policy. As the sole supplier of coal, the NCA controlled coal movement and set a floor price to allow users to make a reasonable return on their investment in coal conversion.

This policy, however, was dropped in favor of the free market policy, which allowed coal users to negotiate for and procure coal without prior NCA approval.

At the same time, the Department of Trade and Industry (DTI) imposed a quantitative restriction (QR) on coal imports. This measure mandates that for every unit volume of coal imported, there should be a corresponding volume of local coal purchased. The current QR ratio is 1:1.

The abolition of the NCA and the relaxation of government control over coal movement paved the way for the gradual deregulation of the coal industry. Through its program of restructuring the energy industry towards greater private sector participation, the Department of Energy, in conjunction with PHILCOAL, DTI, and representatives from the cement and power sectors, drafted a bill lifting the QR. DOE is currently considering alternatives to the QR, with the aim of protecting the existence of the local coal industry, while allowing coal users to meet their coal requirements.

With government support, therefore, coal became a major component of the Philippine energy requirement. Evidence of this achievement is a remarkable increase in coal production. From a 0.39 MT output in 1973, this figure zoomed to its first million mark of 1.02 million MT in 1983. Production has since increased by 37% to 1.4 million MT in 1994, and is expected to reach 3.8 million MT by the year 2000 at an annual growth rate of 18%. Coal reserves stand at 1.6 billion MT, with proven reserves at 385 million and mineable reserves at 293 million MT.

On the utilization aspect, coal contributed a mere 0.2% to the country's total energy consumption in 1973. In 1994, coal consumption was pegged at 6.6%, 4.5% of which was local coal. Coal is expected to contribute to 16% of the total energy mix by the year 2000.

Demand for coal is forecast to increase at an annual rate of 33% to 16.5 million MT by the year 2000. Because consumption will continue to exceed local production, coal imports will account for the shortfall, which is estimated to average 75% of consumption. Coal imports will grow at a rate of 43% up to the year 2000.

Despite the inroads made by the local coal industry, the inferior quality of the bulk of local coal and the inability of producers to provide a stable supply continue to challenge the government's energy self-sufficiency drive.

Coal-bearing strata in the Philippines is geologically young, yielding mostly high-sulfur, bituminous coal. To aggravate the situation, the rather raw technology employed by small coal mines limits an already unreliable production.

Coupled with low productivity and high production costs, these conspire to make imported coal more attractive to coal users. While the programs implemented by the government have proven effective up to the extent of substituting a fraction of oil with coal in the country's energy requirement, the growing rate at which domestic coal is displaced by imported coal remains an issue of concern.

OBJECTIVES:

1. General Objective

To conduct a general assessment of the present state and long-term energy program of coal utilization in the Philippines and to subsequently a) recommend potential areas for development and b) to formulate an integrated coal utilization program aimed toward a wider and more efficient utilization of indigenous coal.

2. Specific Objectives

a. To be able to identify and propose remedial measures to the operational problems that are currently being experienced by domestic coal users.

b. To review and assess existing transportation and distribution networks; storage, handling, and processing problems; and to subsequently identify areas where improvements may be initiated for an efficient and expanded coal logistics system.

c. To research on coal technologies which are 1) directed at upgrading low quality coal resources, and 2) applicable for use only with high-grade coal, so that these may be assessed and investigated as to their appropriateness for local adoption inorder to effect an improved saleability and quality of low-grade domestic coal and to be able to identify extended usages of high-grade coal.

d. To identify potential coal users in domestic and small-scale industries.

e. To initiate technology transfer to both the government and private sector through the conduct of lectures, seminars and workshops focusing on proven techniques in coal utilization applied in the Japanese coal industry.

f. To identify and assess forms of government support and coal industry initiatives that shall bolster the competitiveness of local coal in an increasingly global trading system.

INPUTS:

a) JICA Contribution

The Government of Japan through JICA, shall take the following measures for the implementation of this study:

1. To dispatch, at its own expense, a study team composed of coal experts to the Philippines.

2. Pursue the initial phase of technology transfer by utilizing the members of the study team identified in the above for the conduct of lectures, seminars and workshops.

3. To shoulder all the necessary expenses for the implementation of the project except for those specified as Philippine counterpart.

b) GOP Contribution

The Government of the Philippines, through the Department of Energy, will provide the Japanese Study Team with the following:

1. Available data and information needed for the study;

2. Suitable office space;

3. Arrange/coordinate necessary meetings and plant visits with authorities/agencies concerned;

4. Counterpart personnel (administrative and technical support staff).

BUDGET: (See Attachment 1 for details)

Component		GOJ	GOP
Cost of Hiring Experts		P 14,113,700	P -
Cost for Counterpart Personnel		-	41,600
Meetings		30,000	-
Plant Visits		437,600	10,440
Training Cost		200,000	-
Equipment Outlay		289,050	-
Communication Services		346,176	-
Freight Services		45,210	-
Transportation Services		550,000	100,800
Miscellaneous Expenses		-	70,100
	Sub-Total	16,011,736	222,940
Plus: 4% Contingency		640,469	8,918
	Total P	16,652,205	P 231,858
	Total Project Cost	P 16,884,063	

METHODOLOGY : (See Attachment 2 for Schedule of Activities)

With Japan's vast experience and expertise in coal utilization, a group of Japanese coal experts are to be consulted to undertake the task of preparing a series of studies consistent with the objectives of this proposal.

The project will deal primarily with the formulation of a master plan that would be directed towards the development of coal utilization in the Philippines. It will cover a period of eight (8) months and will include activities such as site surveys, plant visits, meetings and discussions with both private and government agencies. In its review of existing coal transportation and distribution networks, the project shall integrate pertinent results of PNOC-Coal Corporation's study entitled "National Coal Logistics Network."

In the course of the study, the same members of the mission team will be tapped to act as resource persons for lectures, seminars, and workshops.

OUTPUTS :

The output of this project is a cumulative program on the development of coal utilization in the Philippines. It shall be aptly called the "Master Plan".

The master plan will investigate the present conditions of coal utilization and forecast the long-term energy program on the development of the upstream and downstream activities of coal utilization. The team is expected to address the following issues :

A. Coal Utilization

- technical constraints to an expanded domestic coal use
- remedial measures to operational problems
- current and future users

B. Coal Chain System

- loading/unloading ports
- transport
- distribution
- storage, handling, and processing constraints
- identification of areas for improvement

C. Domestic Coal Pricing

- production and transportation costs
- devaluation of prevailing domestic coal prices
- rate of productivity
- landed cost of imported coal
- marketing

- coal price vs. bunker oil price
- analysis of the effects of tariff reduction on the price competitiveness of domestic coal vs. imported coal

D. Potential of Developing Coal Utilization in the Philippines

- coal technologies available worldwide for local adoption
- upgrading of domestic coal quality
- further applications of high-grade domestic coal
- increase in production rate
- expansion of current coal market
- government support mechanisms that shall ensure the viability of the local coal industry in global trade

Attachment 1

BUDGET REQUIREMENT

(In Philippine Pesos)

	GOJ	GOP
A. PERSONAL SERVICES	14,113,700	41,600

A. PERSONAL SERVICES

1.COST OF HIRING EXPERTS

	Man-Months	Cost of Expert	Int'l Airfare	No. of Travels	Hotel Accom (with meals) per m.m			GOJ
Chemist	4	$7,000/m/m	$1,098	3	$200/day×30		[illegible]	
Combustion Engineer	[illegible]	$7,000/m/m	$1,098	5	$200/day×30	=	2,537,250	
Economist	4	$7,000/m/m	$1,098	3	$200/day×30	=	1,832,350	
Chemical Engineer	[illegible]	$10,000/m/m	$1,098	7	$200/day×[illegible]		[illegible]	
Environmental Expert	4	$7,000/m/m	$1,098	3	$200/day×30	=	1,832,350	
Mechanical Engineer	[illegible]	$7,000/m/m	$1,098	5	$200/day×30		2,537,250	
TOTAL	[illegible]					=	14,113,700	14,113,700

2.COUNTERPART PERSONNEL

	Man-Months	P/m/m				GOP
Counterpart Leader (1)	8	2,000	=	P	16,000	
Researcher (4)	8	700	=		22,400	
Clerk (1)	8	400	=		3,200	
TOTAL	24			P	41,600	41,600

	GOJ	GOP
B. MOOE	1,608,356	131,340

B. MOOE

1.MEETINGS

P150/person x 10persons/meeting x 10meetings/month x 2months = P30,000 — 30,000

2.PLANT VISITS

Out-of-town plant visits, ex. potential coal users
Coal terminals

For Local Counterpart Staff

(domestic airfare + per diem) x no. of persons
[P4,400 + 800] x 2 = P10,440 — 10,440

For Japanese Experts

(domestic airfare + allowance) x no. of persons
[P4,400 + ($300/day x P25.67 x 14 days)] x 4 = P437,600 — 437,600

3.TRAINING COST

Seminars/workshops and Lectures on various aspects of Coal Utilization Technology — 200,000

(4 seminars @50,000)

	GOJ	GRP

[illegible] ON SERVICES

[illegible] x 10calls/min x 32mos = [illegible]

[illegible] x 32mos 48,000

[illegible] x P74/page x 32mos [illegible]

Deliveries (local)
[illegible] 500grms x 1000grms/mail x 20mails/mo x 32mos 2,580

[illegible] Mail (overseas)
[illegible] 500grms x 1000grms/mail x 15mails/mo x 32mos 3,540

SUB-TOTAL P 346,176 | 345,176

[illegible] ICES

[illegible] ges for Packages

[illegible] 00grms x 10,000grms + $13.50(service fee)) x P25/$1) + 10%VAT]
[illegible] ckages/month x 6months = P 45,210 | 45,210

[illegible] TION

[illegible] Vehicle
Mazda B2200 Pick-up, double cab
[illegible] 50,000 | 350,000

[illegible]

[illegible] months = P [illegible] | [illegible]

[illegible] US EXPENSES

[illegible]

[illegible] = 23,000

[illegible] Cost

[illegible] 600 copies a month x 6 months = 4,300

[illegible]

[illegible] x 6months = 25,000

[illegible] = 1,300
[illegible] reams = 1,700

[illegible] for fax machine

[illegible] = 5,000

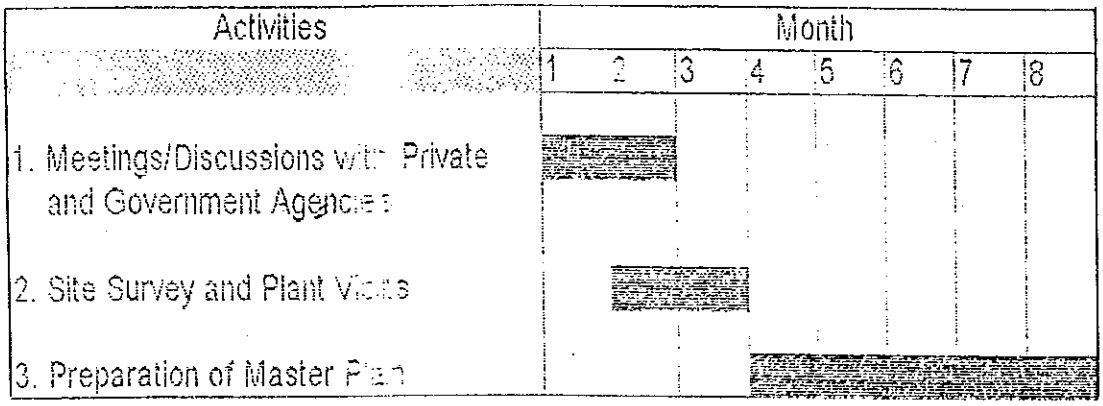
73,100 | [illegible]

			GOJ	GOP
C. CAPITAL OUTLAY			[illegible]	
[illegible]	=	[illegible]		
[illegible]	=	[illegible]		
HP Laser Jet Printer	=	[illegible]		
Computer Table	=	[illegible]		
Computer Chair	=	[illegible]		
SUB-TOTAL	=	[illegible]	[illegible]	
SUB-TOTAL			16,011,736	[illegible]
PLUS: 4% CONTINGENCY			[illegible]	[illegible]
TOTAL			16,652,205	[illegible]
PROJECT COST		P	16,884,063	

Attachment 2

SCHEDULE OF ACTIVITIES

Duration: 8 months



INVENTORY OF MINING AND INDUSTRY (Energy) RELATED PROJECTS

MINING

1. Geological Assessment of Conceptual Approach to the Development of Exploration Strategies for Gold, Precious and Base Metal Mineralization in Catanduanes Area. (DSP-approved)

ENERGY

1. F/S on the Malaya Power Plant Reliability Improvemetn Project (NPC) (on-going DSP)

2. Detailed Marine Survey of the New Submarine Cable Route for Leyte-Mindanao Intrconnection Project (DSP-turned down under DSP FY 1995)

3. Application of New Geophysical Exploration Tool for Deep-Seated Geothermal Resources in Southern Leyte - (PNOC - endorsed under Mini-PTTCP)

4. Inhibition of Silica Deposits from Waste BRines for Geothermal Resource Optimization, Bacon-Manito Geothermal Field - (PNOC - endorsed under Mini-PTTCP)

5. Detailed Coal Exploration on the Newly Identified Potential Coalfields in Central Mindanao (DOE-project still being evaluated by the TIUS)

6. Resource Evaluation of Daklan Geothermal Prospect Areas (DOE-endorsed under PTTCP FY 1996)

7. Development of Philippine Geothermal Resources Management System (DOE-endorsed under Mini-PTTCP FY)

8. Development Survey Assistance Program in the Preparation of a Master Plan Coal Utilization (DOE-endorsed under DSP FY 1996)

9. Ocean Energy Resource Assessmnt Project (DOE-still being evaluated by the TIUS)

10. RP-Japan Technical Cooperation for Coal Combustion Test Pilot (DOE-being programmed under GAP FY 1997)

11. F/S on the Transfer of Facilities and Management of the 69 Kv Transmission Lines and Systems from the National Power Corporation (NPC) to the Electric Cooperatives (ECs) (NEA-turned down under DSP FY 1995)

JICA