Parsons Brinckerhoff Associates

STANDARD REPLACEMENT COSTS FOR CEPALCO

CONFIDENTIAL

FOR

ERC & CEPALCO

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EXECUTIVE SUMMARY

BACKGROUND & OBJECTIVES

The ERC Asset Valuation Guidelines provide ERC policy guidance with respect to the valuation of assets by any one of three methods - the Historical Cost Indexation method, the Current Replacement Cost method and the Modern Equivalent Asset (MEA) method.

A requirement common to each of these methods is the need to set efficient replacement costs.

More broadly, the scope of this paper covers selection of the asset valuation method, setting of the replacement costs and identification of Modern Equivalent Assets within each asset sub-category specified under the DRWG.

The proposals contained herein were prepared independently by PB Associates / Asian Appraisals (the Consultant) acting on behalf of the ERC; our objective is to make clear recommendations with regard to the matters covered under the scope of this companion paper.

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The Consultant has received and incorporated comments from Cepalco with regard to the proposals contained herein.

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APPENDICES:

1. INTRODUCTION

1.1 GENERAL

The electricity regulator in Philippines is proceeding to establish an ODRC valuation methodology in support of the determination of price control and tariff setting.

PB Associates is working on behalf of the ERC to recommend the Asset Valuation parameters required for the valuation of Cepalco assets in accordance with the principles espoused in the ERC Asset Valuation Guidelines.

1.2 SCOPE OF REPORT

The scope of this report covers the determination of the following parameters:

- Standard and non-standard asset categories
- Standard Asset Replacement Costs and Historical Cost Indexes

Standard Asset Lives are included in this report for completeness, but are drawn from the ERC Asset Valuation Guidelines.

These parameters are intended to be used for valuation of the assets of Cepalco.

The scope of this report includes a summary of the details of the information collected from Cepalco, analysis undertaken by PB Associates with reference to technical and regulatory / economic precedents and the details of the consultation conducted with Cepalco.

1.3 STRUCTURE OF REPORT

This report comprises four sections:

Section 1 comprises this brief Introduction.

Section 2 explains the methodology adopted by PB Associates in determining standard asset replacement costs to be used in the Philippines (recap on the method outlined in the ERC Asset Valuation Guidelines

Section 3 discusses “efficient” replacement costs

Section 4 derives the Replacement Costs (RCs) and indexation factors by analysing trended costs from the **Cepalco** asset register (post verification)

Appendix A provides a summary of replacement costs and annual cost growth indexes for each of the Cepalco asset types

2. PB ASSOCIATES METHODOLOGY FOR STANDARD COSTS

2.1 INTRODUCTION

The determination of standard asset replacement costs rests on several considerations:

- A suitable method to benchmark replacement costs as a means of determining efficient costs, and
- A method for determining multipliers such that replacement costs can be based on a single base rate for each asset type modified in accordance with business conditions that are outside the control of the DU.

This companion paper to the ERC Asset Valuation Guidelines makes recommendations on these matters.

2.2 REVIEW OF ERC GUIDING PRINCIPLES

The pertinent guiding principles outlined in the ERC Asset Valuation Guidelines are restated as follows:

- Each of the asset groups and subgroups should be allocated a per unit replacement cost for its modern equivalent, or be assigned a suitable growth index for installed costs;
- Since cost efficiency and consistency of valuation between DUs is an important objective, it is appropriate that efficient standard costs be applied by all DUs. The method for determining standard costs and growth indexes is set out in Appendix B of the ERC Asset Valuation Guidelines. Appendix B includes explanatory notes on how the standard costs and indexes should be used. Standard costs should be applied unless there is good reason to do otherwise. Justifications for all departures from the standard costs should be documented with a clear audit trail;
- The standard costs do not cover every type of construction and site condition, but their use should allow the majority of the assets to be assessed.
- There may be considerable variation in the unit costs of lines depending on the region, general topography, diversity of development and accessibility. The costing methodology is expected to make allowance for such variations if the asset register is sufficiently mature to identify assets affected by such factors.

2.3 DETERMINATION OF STANDARD ASSET REPLACEMENT COSTS

The methodology employed by PB Associates followed the process outlined in the ERC Asset Valuation Guidelines:

Step 1 – Classification of Assets (without materiality)

A standard asset categorisation was developed covering all types of assets found in the fixed asset registers of Cepalco.

Step 2 – Standard Assets (with materiality)

Once the fixed asset registers were sorted into the standard categories, materiality considerations guided the process of selection of standard and non-standard assets. Standard assets are those assets that have a physical count / value totalling at least 5% for a given subcategory. Assets that fall below this threshold are considered as non-standard and can either be assigned to an adjacent category or valued using indexed historical costs.

As a general principle we included standard asset types within each DWRG subcategory. As an example, standard asset types within the pole subcategory would be found in the steel pole and concrete pole subcategory. While all steel poles could be ignored on the basis of materiality when compared to concrete poles, we retain steel poles as an asset subcategory for purposes of deriving an historical cost trend as the installed cost of steel poles is likely to escalate at a different rate to concrete or wood pole costs.

Step 3 – Value Standard Assets

Step 3a – Current Replacement Costs

Historical cost trending of actual installed costs was used (as described in Step 3) to estimate replacement costs for the valuation date. This served a dual purpose as it also verified the register information, revealing possible outliers that could be the result of data entry errors.

Step 3b - Benchmarking

Since the 'actual' replacement costs reported by a DU may not represent efficient replacement costs, it is necessary to benchmark these costs. This can be done through peer review for each standard asset type but if it is not possible to do so in a robust manner, then it requires a building block method whereby individual cost components are benchmarked to determine whether the actual costs represent efficient costs. The method used differs according to whether the assets have foreign equipment components or locally manufactured components. For imported items, market prices observed outside Philippines can be used to determine an index for market price movements and these can be related to the FOB prices of equipment imported into the Philippines per the corresponding price movements shown by the purchase records of the DU.

For locally manufactured items, the primary evidence is DU records where large quantities have been recorded. In this regard, materials and equipment costs are primarily a function of the effectiveness of the DU procurement processes in obtaining a price as close as possible to the market clearing price. We benchmark the procurement processes of the DU in a qualitatively to determine whether there is scope for procurement efficiencies.

Recent purchase prices of the DU reveal the market clearing price. However, the use of this information is problematic. Firstly under performance-based regulation the price paid for materials and equipment represents a competitive advantage. Secondly, a Regulator must take care to avoid the perception of price fixing by ensuring that price signals are not sent to the market. In South

Africa, a manufacturers association threatened legal action on the basis of a concern that gazetted replacement costs (based on manufacturer's surveys) would create a "market distortion".

The problem of market distortion can be overcome by not revealing the market prices paid for materials and equipment outside of the ERC.

Step 4 – Value Non-Standard Assets

As described in Step 3a, historical cost patterns were examined from Cepalco ODRC registers. Historical indexes based on actual costs were determined. A weighted average historical index was struck based on the movement in actual replacement costs for standard assets. This index is used to roll forward the historical costs of all non-standard asset categories, or should a non-standard category be of a similar size to a standard category the index of that category can be used.

2.4 EFFICIENT REPLACEMENT COSTS

There are several methods in use to determine 'efficient' replacement costs.

A common approach is to benchmark replacement costs reported by the DU for each standard asset.

This approach is taken in New Zealand where there are 27 lines companies that report replacement costs. The business conditions faced by the lines companies are similar and this means that replacement costs can be directly compared as the peer group is sufficiently large to establish the 'efficient' replacement cost.

In the Philippines, the initial price determination is only applicable to three DUs. Furthermore the DUs face diverse business conditions. These factors work against the use of 'actual cost' benchmarking to determine efficient replacement costs.

As a result PB Associates has examined the major components of controllable cost that make up replacement costs.

There are two such components[1]:

- Engineering and Design Overheads
- Labour + Materials Costs

The on-costs are those costs that represent a reasonable allocation of the corporate overheads and network management overheads applied to capital expenditure.

Engineering and design overheads costs are the costs that accrue to capital projects.

[1] PB Associates has not benchmarked direct / indirect on-costs. These costs are embedded in the labor rate.

For the purposes of benchmarking, the labour costs can be further broken down into a man-hour rate and the hours (based on standard crews) required for replacement of each asset type. PB Associates has benchmarked each factor separately.

As previously mentioned in Section 2.3, equipment and materials costs are set by the market and the actual prices paid are a function of the effectiveness of the DU procurement policy and practices. PB Associates has examined the procurement processes of the DUs in a qualitative sense to determine if they are robust.

2.5 INFORMATION SOURCES

In summary PB Associates has estimated replacement costs for the Cepalco assets using information from the following sources:

- **DU Fixed Asset Registers:** We examined the historical cost data to develop a current replacement cost based on an average cost to construct assets;
- **DU Equipment / Material Purchase Costs:** We sought evidence of volume purchasing efficiencies;
- **DU Procurement Policies & Practices:** We compared the practices of the DUs and looked for evidence of inefficiencies;
- **Previous DU Valuations:** We considered the Reproduction Cost New values used for the 2002 and 2004 Cepalco Valuations based on the valuation reports prepared by Asian Appraisals CI on behalf of the DUs;
- **International Prices:** We benchmarked the prices paid for imported goods based on our international database for power equipment; and
- **Multipliers:** We considered the replacement cost multipliers in use in other regulatory jurisdictions.

3. EFFICIENT REPLACEMENT COSTS

3.1 CEPALCO PROCUREMENT PROCESSES

Best practice in procurement is evidenced by the following practices:

1. Identifying business needs with users and ensuring active participation in the Corporate Strategic Planning process;

2. Conducting market studies for strategic materials and services. This requires active participation of multi-functional teams in the development and design of materials and service requirements and their specifications;

3. Identifying potential suppliers;

4. Use of multi-functional teams in a structured approach to supply planning, specific requirement identification, contract and relationship strategies, supplier qualification and selection, and negotiation;

5. Contract management which involves the administration and resolution of related changes and issues arising during the contract term. It also includes the management of supplier quality and performance, and the monitoring of continuous improvement in the supply chain;

6. For key suppliers that are strategically critical to the business, the establishment of relationship agreements and continuous improvement programmes for the achievement of objectives for performance improvement related to business needs;

7. Maintaining an information database of contract and purchasing records, including past performance record;

8. Developing, maintaining and implementing procurement policies and procedures;

9. Ensuring that all procurement activities are governed by the highest professional and ethical standards regardless of who performs them;

10. Purchasing of inbound transportation for deliveries from overseas suppliers;

11. Identifying risks and opportunities in the Company's supply portfolio;

12. Supplier performance measurement; and

13. Development of strategic, long-term plans for sourcing of all major commodities.

Cepalco is a relatively small company and yet PB Associates observed several examples suggesting efficiency in procurement.

Observations by PBA Associates:

1. Procurement of concrete poles from a local manufacturer is a cost effective decision that recognizes the strategic importance of a low cost supply of a major item;

2. Cepalco maintains records of contract and procurement outcomes;

3. Cepalco formally evaluates tender bids and negotiates on price; and

4. Cepalco tracks asset performance and works with suppliers to solve emerging problems as part of a continuous improvement program.

5. An annual competitive tendering programme is in place for the procurement of normal service materials that are expected to be installed over the coming year. This process is administered by the Cepalco pre-qualification, bidding and awards committee, which consist of representatives from their business units. Bids are sort from all known suppliers. Only tenders received within the stipulated quotation period are considered for price and technical evaluation, with award being made to the lowest conforming tender.

6. For commercial and company initiated projects the materials list is submitted on completion of the design and tenders for the supply of materials sort for planned development projects.

This procurement process is fair and reasonable in achieving the most economical cost for new equipment and materials.

Overall, PB Associates finds that Cepalco procurement processes are sufficiently robust to ensure that efficient market prices are captured for items of high value.

3.2 IN-HOUSE VERSUS CONTRACT LABOUR

Cepalco uses a mixture of in-house and contract labour.

Currently Cepalco use their in-house staff for the administration and design of all new projects. Maintenance and construction work is undertaken using their in-house staff if there are sufficient resources available.

For large capital works projects competitive tendering of the construction work is performed, with bidding administered by the Cepalco pre-qualification, bidding and awards committee. For these larger projects, typically three or four pre-selected contractors would be invited to submit a tender. (Cepalco construction staff do not competitively bid where this tender process is being used). PB Associates understands that direct contract labour rates are approximately 50% of Cepalco’s in-house labor rate.

In setting replacement costs under an ODRC valuation, the labour rate should be that enjoyed when replacing significant parts of the distribution network. Accordingly, PB Associates has benchmarked replacement costs on the basis of contract labour which would supplement in-house resources for projects of significant scale.

Our approach does not imply that PB Associates is supporting greater use of contract labour by Cepalco. Such considerations are matters of strategic importance to Cepalco and fall outside the scope of a valuation.

3.3 IMPACT OF COMMODITY PRICES

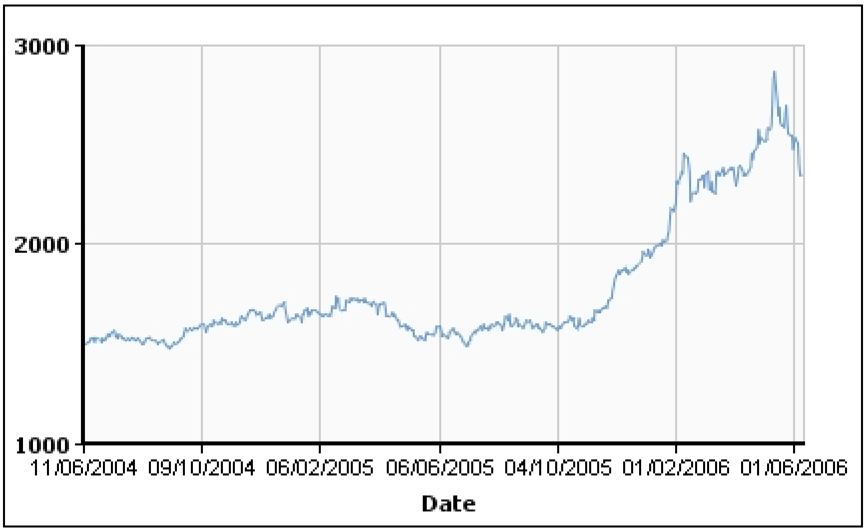
In forward expenditure forecasting it is not uncommon for utilities to model material costs to increase in line with inflation over future regulatory periods.

For example, ETSA Utilities factored material costs to increase in line with CPI, refer to page 143 of PB Associates, South Australian Electricity Distribution Price Review prepared for the Essential Services Commission of South Australia, and energyAustralia have forecast all non labour costs to increase in line with CPI in their last Submission to the Australian Competition and Consumer Commission, Transmission Revenue Reset 2004 – 2009 refer to page 21 of Attachment 5.

PB Associates has researched recent prices on the London Metal Exchange (LME) for non ferrous base metals and note significant volatility over the past two years. However this volatility may indicate that current prices are at or near the maximum for the current cycle. In addition forward prices, particularly for copper, now indicate sharp declines from their recent highs. For example the LME official prices for 23 June 2006 quoted a cash buyer price for copper a USD 6,710 per tonne and a 27 months forward contract buyer price of USD 4,965 per tonne.

Figure (i) and Figure (ii) taken from the historical data section of the LME website indicate that the current price increases are a relatively recent phenomenon which is supported by price history information over a longer period. Both graphs indicate a recent significant downturn in prices. In addition the price history for zinc, used for galvanising, displays a similar recent price increase but historical prices are relatively stable.

Figure (i): LME Aluminium Alloy Price Chart (USD/tonne)



Source: London Metal Exchange

Figure (ii): LME Copper Price Chart (USD/tonne)

Source: London Metal Exchange

In Australia, the Federal Government's current budget incorporates an assumption that commodity prices will fall significantly in the next two to three years, and some economists believe that the fall in commodity prices could be sharper than the Treasury has allowed for. In a recent report, the OECD notes that "the major uncertainty about the outlook for the Australian economy concerns the timing and the extent of the eventual downturn in commodity prices"[2].

On balance we consider that by the time the next regulatory period commences in July 2007 the current high prices for both base materials and manufactured equipment could well have fallen in line with historical cost trends and that future price increases would be more likely to escalate in line with CPI movements.

In this report, we have benchmarked Cepalco material cost estimates for substation equipment using an international database of ex-works prices. The ex-works prices are based on detailed analysis performed in 2002 with subsequent price escalation by CPI. These prices do not recognise the significant commodity price increases during the last 12 months. We added overhead costs, such as taxes and labour rates, at current efficient rates. Accordingly the substation equipment replacement costs recommended by PB Associates are based on historical cost trends and do not fully capture short term transient increases in commodity prices.

For the case of the repetitive assets, we obtained manufacturers quotes for wire and transformers and found significant increases in the cost of materials since 2004, again reflecting the increase in commodity metals prices. We compared manufacturer costs with material costs proposed by Cepalco and determined that Cepalco costs are long term averages and are generally lower than current material prices. Again, we added overhead costs at current efficient rates. The repetitive asset replacement costs recommended by PB Associates are effectively based on historical cost trends i.e. they do not reflect short term transient increases in commodity prices.

[2] Refer Australian Financial Review article May 27, 2006 titled "The Economy".

A further consideration in support of this approach is that the hike in commodity prices is to some extent buffered by manufacturing stocks and helps to smooth out extreme price increases of short duration.

In summary, PB Associates has determined replacement costs on the basis that material costs should not exceed 2004 costs escalated at CPI (the average CPI from 2004 to mid-2006 has been 8% per annum). This principle has been applied in developing recommendations for replacement costs for the Cepalco ODRC valuation.

4. CEPALCO VALUATION METHODOLOGY

In this Section we determine the valuation method most suited to a given asset sub-category, and proceed to establish efficient replacement costs and indexes. In those cases where MEA valuation is warranted we propose a suitable MEA and replacement cost.

A1 – LAND AND LAND RIGHTS

AACI has valued land using the fair market valuation technique. The details are provided in a separate report.

A2 – STRUCTURES AND IMPROVEMENTS

AACI has valued structures and improvements using fair market value. The details are provided in a separate report.

A3 – STATION EQUIPMENT

A3A – Power Transformers

Cepalco has 7 power transformers as shown in Table 1. The power transformers have been valued using a Replacement Cost Method.

Table 1: Assets In Use

Power Transformers	Count	Year installed	Historical Cost per Unit (Php)
Power Transformer, 69/13.8 kV, 10 MVA, Off Load Tap Changer	1	1978	654,916
Power Transformer, 69/13.8 kV, 15/20 MVA, Off Load Tap Changer	1	1994	9,414,746
Power Transformer, 69/34.5 kV, 10 MVA, Off Load Tap Changer	1	1973	772,760
	1	1990	4,982,716
Power Transformer, 69/34.5 kV, 33 MVA, Off Load Tap Changer	1	2002	37,856,120
	1	1995	290,894
	1	1977	3,292,220

Building Block Verification of Replacement Costs

Table 2: International Ex-Works Cost for Power Transformers

The costs shown here are for transformers that are assumed to have forced cooling.

Rated Voltage (kV)	Rating (MVA)	Cost Ex-works £
72.5/36	60	265,000
	45	289,000
	30	188,000
72.5/24	30/60	195,000

Rated Voltage (kV)	Rating (MVA)	Cost Ex-works £
	20/40	162,000
	16/32	140,000
	12/24	113,000
	10	95,000
	7.5	84,000
72.5/12	20/40	196,000
	16/32	154,000
	12/24	123,000
	10	115,000
	7.5	110,000
36/24	4	91,200
36/12	38	308,000
	24	210,000
	20/40	184,000
	15	150,000
	12/24	128,000
	10	112,000
	7.5	100,000

Using these tables, PB Associates has determined the ex-works costs of Cepalco's power transformers (using the nearest possible match and interpolation) to be as follows:

Table 3: International Prices Ex-Works

Power Transformers	PBA Cost Ex-Works £	Php @ 96 Php per £
Power Transformer, 69/13.8 kV, 10 MVA, Off Load Tap Changer	130,727	12,549,750
Power Transformer, 69/13.8 kV, 15/20 MVA, Off Load Tap Changer	175,060	16,805,750
Power Transformer, 69/34.5 kV, 10 MVA, Off Load Tap Changer	128,453	12,331,500
Power Transformer, 69/34.5 kV, 33 MVA, Off Load Tap Changer	188,000	18,048,000

Summary of Proposed Valuation Approach

PB Associates propose to value Power Transformers using the current replacement cost method.

A sanity check was made with regard to historical costs, and particularly where recent installation costs were available. In this case the historical costs were of mixed presentation.

The analysis in the preceding section suggests the following RCs for Cepalco Power Transformers.

Table 4: RC for Power Transformers

Power Transformers	PBA Ex-Works Cost Jun 06	Installation Overhead + 12% VAT	RC at Jun 2006 (Php)
Power Transformer, 69/13.8 kV, 10 MVA, Off Load Tap Changer	12,549,750	1.17	14,683,200
Power Transformer, 69/13.8 kV, 15 MVA, Off Load Tap Changer	16,805,750	1.17	19,662,720
Power Transformer, 69/34.5 kV, 10 MVA, Off Load Tap Changer	12,331,500	1.17	14,427,840
Power Transformer, 69/34.5 kV, 33 MVA, Off Load Tap Changer	18,048,000	1.17	24,003,840

A3B – Switchgear

Cepalco has a total of 25 circuit breakers and 140 disconnectors in use.

(i) Circuit Breakers

Circuit breakers have been valued using the current replacement cost method.

Table 5: Assets In Use

Circuit Breakers	Count	Year installed	Historical Cost per Unit (Php)
SF6 Dead Tank Circuit Breaker, 13.8 kV Outdoor, 1200 A, 25 kA	2	1996	1,582,456
SF6 Dead Tank Circuit Breaker, 13.8 kV Outdoor, 1200 A, 25 kA	1	2002	1,445,409
SF6 Dead Tank Circuit Breaker, 13.8 kV Outdoor, 1200 A, 25 kA	2	1996	1,017,788
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 25 kA	1	2005	1,499,694
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 25 kA	2	1998	1,063,353
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 25 kA	2	1977	1,148,945
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 31.5 kA	1	2002	3,852,929
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 31.5 kA	2	2002	3,865,404
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 31.5 kA	2	1996	2,326,266
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 25 kA	1	1991	2,771,482
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 25 kA	1	1998	1,151,839
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 25 kA	1	1977	1,148,945
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 40 kA	1	1997	2,332,125
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1600 A, 40 kA	3	2002	4,505,859
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 2000 A, 40 kA	1	1997	2,553,647
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 2000 A, 40 kA	1	1996	2,498,051

Building Block Verification of Replacement Costs

Table 6: International Ex-Works Cost for Circuit Breakers

Rated Voltage (kV)	Normal Current Rating (A)	Short Circuit Current (kA)	Cost Ex-works £
Outdoor Dead Tank CBs			
72.5	3150	40	35,250
	3150	31.5	32,250
	2500	25	28,800
	2000	25	28,600
36	2500	25	32,000
	1250, Vacuum	25	22,150
	1250	25	18,100
	800	25	15,500
Indoor			
12	Transformer incomer panel	2000	23,500
	Feeder panel	2000	20,500
	Bus section panel	2000	20,000
	Transformer incomer panel	1250	16,500
	Feeder panel	1250	14,500
	Bus section panel	1250	12,600

Using these tables, PB Associates has determined the ex-works costs of Cepalco circuit breakers (using the nearest possible match and interpolation) to be as follows:

Table 7: International Prices Ex-Works

Circuit Breakers	PBA Cost Ex-Works £	Php @ 96 Php per £
SF6 Dead Tank Circuit Breaker, 13.8 kV Outdoor, 1200 A, 25 kA	21,902	2,102,564
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 25 kA	23,286	2,235,446
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 31.5 kA	33,641	3,229,538
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 40 kA	30,277	2,906,585
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1600 A, 40 kA	33,904	3,254,769
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 2000 A, 40 kA	37,058	3,557,538

Summary of Proposed Valuation Approach

PB Associates propose to value Circuit Breakers using the current replacement cost method. A sanity check was made with regard to historical costs, and particularly where recent installation costs were available.

In this case the historical costs were of mixed presentation. The power transformer purchased in 2002 appears to have a very high price.

The analysis in the preceding section suggests the following RCs for Cepalco Circuit Breakers:

Table 8: RC for Circuit Breakers

Circuit Breakers	PBA Ex-Works Cost Jun 06	Installation Overhead + VAT 12%	RC at Jun 2006 (Php)
SF6 Dead Tank Circuit Breaker, 13.8 kV Outdoor, 1200 A, 25 kA	2,102,564	1.17	2,460,000
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 25 kA	2,235,446	1.17	2,615,472
SF6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 31.5 kA	3,229,538	1.17	3,778,560
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 40 kA	2,906,585	1.17	3,400,704
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1600 A, 40 kA	3,254,769	1.17	3,808,080
SF6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 2000 A, 40 kA	3,557,538	1.17	4,162,320

(ii) Disconnectors

Table 9: Assets In Use

Disconnectors	Count	Year installed	Historical Cost per Unit (Php)
Disconnector, 115 kV, 1200 A, ground mounted with support structure	1	2005	298,275
	1	2005	580,398
	1	2005	398,464
Disconnector, 13.8 kV, 400 A, mounted on bus structure supports	3	1998	114,011
	2	1998	53,948
	7	1990	5,581
Disconnector, 13.8 kV, 600 A, mounted on bus structure supports	3	1990	12,449
Disconnector, 34.5 kV, 200 A, mounted on bus structure supports	27	1993	18,368
	1	1990	13,326
	27	1990	18,240
	1	1990	122,470
Disconnector, 34.5 kV, 400 A, mounted on bus structure supports	8	1991	139,839
Disconnector, 34.5 kV, 600 A, mounted on bus structure supports	1	2001	269,467
	1	2001	269,467
	3	1990	23,238
	7	1990	61,656
Disconnector, 34.5 kV, 1200 A, mounted on bus structure supports	2	2001	526,402
	6	2002	640,558

Disconnectors	Count	Year installed	Historical Cost per Unit (Php)
	1	2004	269,428
	1	2002	445,784
	1	2004	189,691
Disconnector, 69 kV, 1200 A, ground mounted with support structure	2	1996	518,044
	6	1996	34,007
	3	1996	435,675
	1	1996	494,135
	2	2002	624,988
	7	1998	207,315
	1	2005	965,402
	1	2005	534,828
	1	2004	557,542
	4	2002	1,070,184
	1	1999	271,584
	1	2002	6,245,600
	1	1990	402,402
	1	2004	687,694
	4	2003	408,199
	1	1990	718,742

Building Block Verification of Replacement Costs

Table 10: International Prices Ex-Works

Disconnectors	PBA Cost Ex-Works £	Php @ 96 Php per £
Disconnector, 115 kV, 1200 A, ground mounted with support structure	7,033	675,148
Disconnector, 13.8 kV, 400 A, mounted on bus structure supports	1,352	129,836
Disconnector, 13.8 kV, 600 A, mounted on bus structure supports	1,803	173,115
Disconnector, 34.5 kV, 200 A, mounted on bus structure supports	1,954	187,541
Disconnector, 34.5 kV, 400 A, mounted on bus structure supports	2,354	226,011
Disconnector, 34.5 kV, 600 A, mounted on bus structure supports	2,755	264,480
Disconnector, 34.5 kV, 1200 A, mounted on bus structure supports	4,057	389,508
Disconnector, 69 kV, 1200 A, ground mounted with support structure	4,301	412,879

Summary of Proposed Valuation Approach

PB Associates propose to value Disconnectors using current replacement cost method. The analysis in the preceding section suggests the following RCs for Cepalco Disconnectors:

Table 11: RC for Disconnectors

Disconnectors	PBA Cost Ex-Works Pesos	Installation Overhead + VAT 12%	RC at Jun 2006 (Php)
Disconnector, 115 kV, 1200 A, ground mounted with support structure	675,148	1.22	823,680
Disconnector, 13.8 kV, 400 A, mounted on bus structure supports	129,836	1.22	158,400
Disconnector, 13.8 kV, 600 A, mounted on bus structure supports	173,115	1.22	211,200
Disconnector, 34.5 kV, 200 A, mounted on bus structure supports	187,541	1.22	228,800
Disconnector, 34.5 kV, 400 A, mounted on bus structure supports	226,011	1.22	275,734
Disconnector, 34.5 kV, 600 A, mounted on bus structure supports	264,480	1.22	322,666
Disconnector, 34.5 kV, 1200 A, mounted on bus structure supports	389,508	1.22	475,200
Disconnector, 69 kV, 1200 A, ground mounted with support structure	412,879	1.22	503,712

A3C – Protective Equipment

(i) Current Transformers

The Cepalco Fixed Asset Register contains no separate HV CTs in use as their costs are included with the dead tank Circuit Breakers.

(ii) Potential Transformers

Cepalco has 48 Potential Transformers in use.

Table 12: Assets In Use

PTs	Count	Year installed	Historical Cost (Php)
Potential Transformers, 13.8 kV, Outdoor, 120/70:1	3	2001	98,368
Potential Transformers, 34.5 kV, Outdoor, 350/175: 1	3	2002	166,196
	3	2002	514,755
	3	2001	224,862
	3	2002	551,618
	3	2003	97,770
Potential Transformers, 69 kV, Outdoor,	6	2002	522,995

PTs	Count	Year installed	Historical Cost (Php)
	1	2001	761,841
	4	1997	3,452
	12	1996	160,919
	3	2001	236,892
	4	1996	572,853
	48		

Building Block Verification of Replacement Costs

Table 13: International Prices Ex-Works

Potential Transformers	PBA Cost Ex-Works £	Php @ 96 Php per £
Potential Transformers, 13.8 kV, Outdoor, 120/70:1	1,632	156,672
Potential Transformers, 34.5 kV, Outdoor, 350/175: 1	1,632	156,672
Potential Transformers, 69 kV, Outdoor, 600/350:1	2,526	242,361

Summary of Proposed Valuation Approach

PB Associates propose to value PTs using current replacement cost method. The analysis in the preceding section suggests the following RCs:

Table 14: RC for PTs (each)

Potential Transformers	PBA Cost Ex-Works Pesos	Installation Overhead + VAT 12%	RC at Jun 2006 (Php)
Potential Transformers, 13.8 kV, Outdoor, 120/70:1	156,672	1.22	191,140
Potential Transformers, 34.5 kV, Outdoor, 350/175: 1	156,672	1.22	191,140
Potential Transformers, 69 kV, Outdoor, 600/350:1	242,361	1.22	295,680

(iii) Lightning Arresters

Cepalco has 3,777 Lightning Arresters (of which only 11 are rated below 10kV).

Building Block Verification of Replacement Costs

Table 15: International Prices Ex-Works

Lightning Arresters	PBA Cost Ex-Works £	Php @ 96 Php per £
Lightning Arrester, 6 kV, Distribution Class (6.24 kV system voltage)	18	1,750
Lightning Arrester, 15 kV, Distribution Class (13.8 kV system voltage)	29	2,784
Lightning Arrester, 27 kV, Distribution Class (34.5 kV system voltage)	50	4,773
Lightning Arrester, 60 kV, Station Class (69 kV system voltage)	854	81,970

Summary of Proposed Valuation Approach

PB Associates propose to value LA's using current replacement cost method. The analysis in the preceding section suggests the following RCs:

Table 16: RCs for LA's

Lightning Arresters	PBA Cost Ex-Works Pesos	Install Overhead + VAT 12%	RC at Jun 2006 (Php)
Lightning Arrester, 6 kV, Distribution Class (6.24 kV system voltage)	1,750	1.32	2,310
Lightning Arrester, 15 kV, Distribution Class (13.8 kV system voltage)	2,784	1.32	3,675
Lightning Arrester, 27 kV, Distribution Class (34.5 kV system voltage)	4,773	1.32	6,300
Lightning Arrester, 60 kV, Station Class (69 kV system voltage)	81,970	1.22	100,000

(iv) Protection Schemes & Relays

Cepalco has several kinds of protection schemes and relays:

Building Block Verification of Replacement Costs

Table 17: International Prices Ex-Works

Protection Schemes & Relays	PBA Relay Cost Ex-Works USD	Php
Over / Underfrequency Relays	1,700	112,000

Protection Schemes & Relays	PBA Relay Cost Ex-Works USD	Php
34.5 kV (and below) Feeder Protection (3 feeders per protection panel)	8,700	234,000
230/115/69 kV Transformer Differential Protection Scheme (1 panel per transformer)	5,000	324,000

Summary of Proposed Valuation Approach

PB Associates propose to value protection schemes and relays using current replacement cost method. The analysis in the preceding section suggests the following RCs:

Table 18: RCs for Protective Equipment

Protective Equipment	PBA Cost Ex-Works Pesos	Installation Cost Pesos	RC at Jun 2006 (Php)
Over / Underfrequency Relays	112,000	388,000	500,000
34.5 kV (and below) Feeder Protection (3 feeders per protection panel)	234,000	541,000	775,000
230/115/69 kV Transformer Differential Protection Scheme (1 panel per transformer)	324,000	490,000	814,000

A3D – Metering & Control

Cepalco has a small quantity of Metering & Control Equipment in use. These assets shall be valued using historical cost indexation at a rate of 4.5% per annum.

A3E – Communications Equipment

The Cepalco Fixed Asset Register contains a SCADA system. These assets have been valued using historical cost indexation at a rate of 4.5% per annum.

A3F – Other Station Equipment

(i) Battery / Chargers

The Cepalco Fixed Asset Register contains 1 set of storage batteries (Lead Acid 180 AH; 60 - 2V Cells; 120 VDC). The international ex-works benchmark cost for battery and charger is ₤11,340 or Php1,089,000.

The replacement cost is set with a 22% overhead (12% VAT and 10% installation) at Php 1,328,400.

(ii) Distribution Boxes

The Cepalco Fixed Asset Register contains no Distribution Boxes in use.

A4 & A5 – TOWERS, POLES & FIXTURES (DISTRIBUTION)

Cepalco has 24,754 distribution poles comprising 8,360 concrete (33.8%), 16,017 wood (64.7%), and 377 steel poles (1.5%).

PB Associates trended the historical costs for those poles of count (or aggregate historical cost) greater than 5%, shown as the shaded rows in Table 19.

The historical costs were drawn from Cepalco's verified ODRC asset register.

Table 19: Assets In Use

Pole Type	Count	% by Count	% by Value
POLE, STEEL; 115 KV 32.0M OCTAGONAL	7	0.03%	0.38%
POLE, CONCRETE; 15.0 M (50 FT)	293	1.18%	3.83%
POLE, CONCRETE; 16.5 M (55 FT)	2	0.01%	0.03%
POLE, CONCRETE; 18.0 M (60 FT)	56	0.23%	1.04%
POLE, CONCRETE; 20M (65 FT)	5	0.02%	0.10%
POLE, CONCRETE; 21.4M (70 FT)	6	0.02%	0.19%
POLE, CONCRETE; 23M (75 FT)	268	1.08%	9.26%
POLE, CONCRETE; 24.5M (80FT)	30	0.12%	1.41%
POLE, CONCRETE; SIZE 10.5 M (35 FT)	10	0.04%	0.04%
POLE, CONCRETE; SIZE 12.0 M (40 FT)	1,657	6.69%	9.66%
POLE, CONCRETE; SIZE 13.5 M (45 FT)	1206	4.87%	11.80%
POLE, CONCRETE; SIZE 7.5 M (25 FT)	4,071	16.45%	12.58%
POLE, CONCRETE; SIZE 9.0 M (30 FT)	756	3.05%	3.54%
POLE, STEEL, 24 M (80 FT)	19	0.08%	0.65%
POLE, STEEL, 75FT (22.50)	52	0.21%	2.37%
POLE, STEEL; 12.0 M (40 FT)	23	0.09%	0.23%
POLE, STEEL; 16.5 M (55 FT)	61	0.25%	2.22%
POLE, STEEL; 21.0 M (70 FT)	41	0.17%	1.83%
POLE, STEEL; 7.5 M (25 FT)	174	0.70%	0.93%
POLE, WOOD; SIZE 10.5 M (35 FT)	1559	6.30%	3.33%
POLE, WOOD; SIZE 12.0 M (40 FT)	1,756	7.09%	5.76%
POLE, WOOD; SIZE 13.5 M (45 FT)	879	3.55%	3.46%
POLE, WOOD; SIZE 15.0 M (50 FT)	208	0.84%	0.95%
POLE, WOOD; SIZE 16.5 M (55 FT)	55	0.22%	0.24%
POLE, WOOD; SIZE 18.0 M (60 FT)	116	0.47%	0.63%
POLE, WOOD; SIZE 19.5 M (65 FT)	123	0.50%	1.01%
POLE, WOOD; SIZE 21.0 M (70 FT)	121	0.49%	1.34%
POLE, WOOD; SIZE 22.5 M (75 FT)	53	0.21%	1.24%
POLE, WOOD; SIZE 24.0 M (80 FT)	33	0.13%	0.72%
POLE, WOOD; SIZE 25.5 M (85 FT)	10	0.04%	0.65%
POLE, WOOD; SIZE 7.5 M (25 FT)	10,292	41.58%	17.29%
POLE, WOOD; SIZE 9.0 M (30 FT)	812	3.28%	1.32%
Grand Total	24,754	100.00%	100.00%

The shaded rows – the most common asset types – account for **84%** of the count and **70%** of the aggregated historical value.

High and low outliers were removed until a trend line with R-squared of more than 0.05 was established. The R-squared value is a measure of the match between a valuation based on Indexed Historical Costs (IHC) and a valuation based on Replacement Costs.

The trended cost is taken to be the long run marginal cost of installing a pole.

Variations about the trend line can be explained in terms of time taken for particular installations (or in some cases due to inaccuracies in the register). This method takes into account diverse business conditions within Cepalco service territory without employing the use of specific 'multipliers' e.g. for rocky soil conditions.

The charts also provide an annual index for each of the most common poles. The indices for the most common assets were weighted by count to determine an overall weighted average index for non-standard poles. Separate indexes were determined for poles of different nature i.e. wood, concrete and steel pole indexes.

(i) Standard Concrete Poles

Figure 1: Concrete Pole – 75 ft

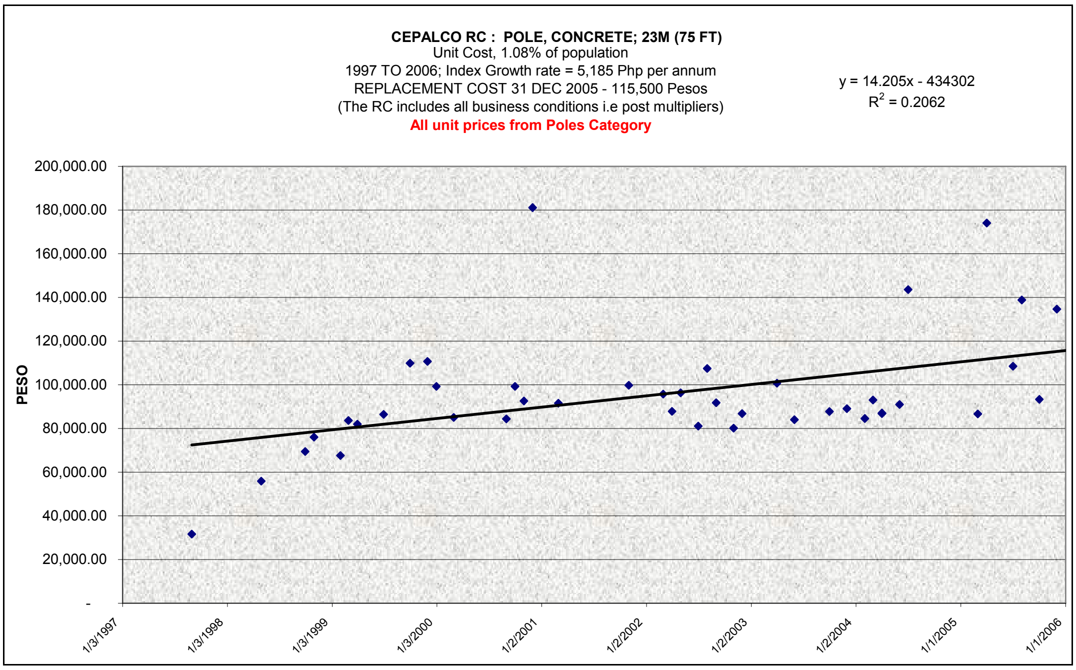


Figure 2: Concrete Pole – 40 ft

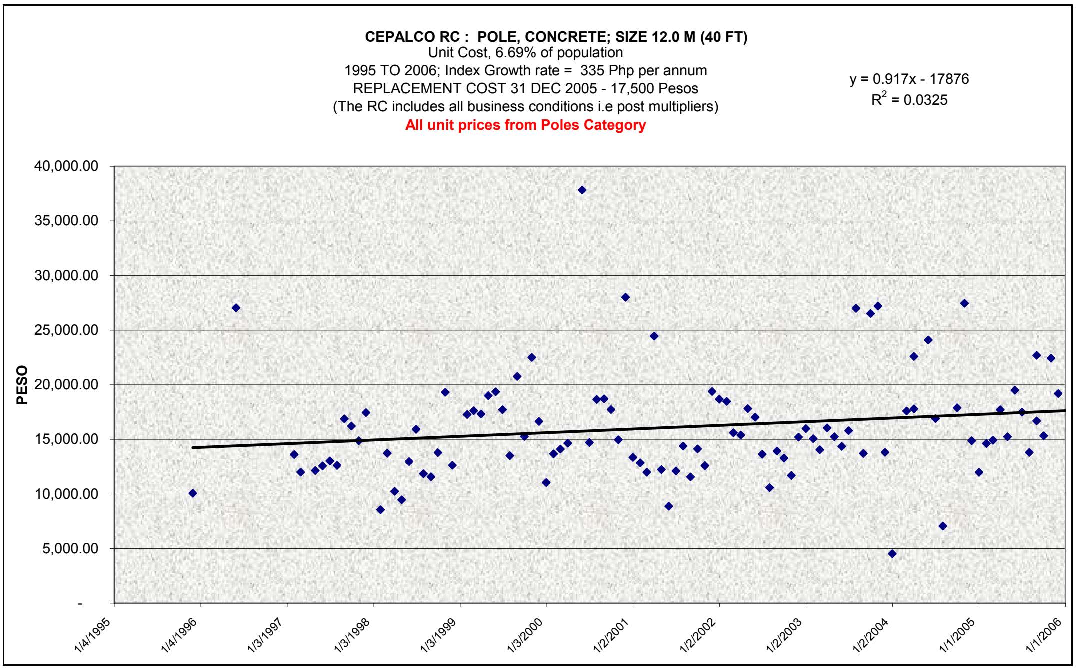


Figure 3: Concrete Pole – 45 ft

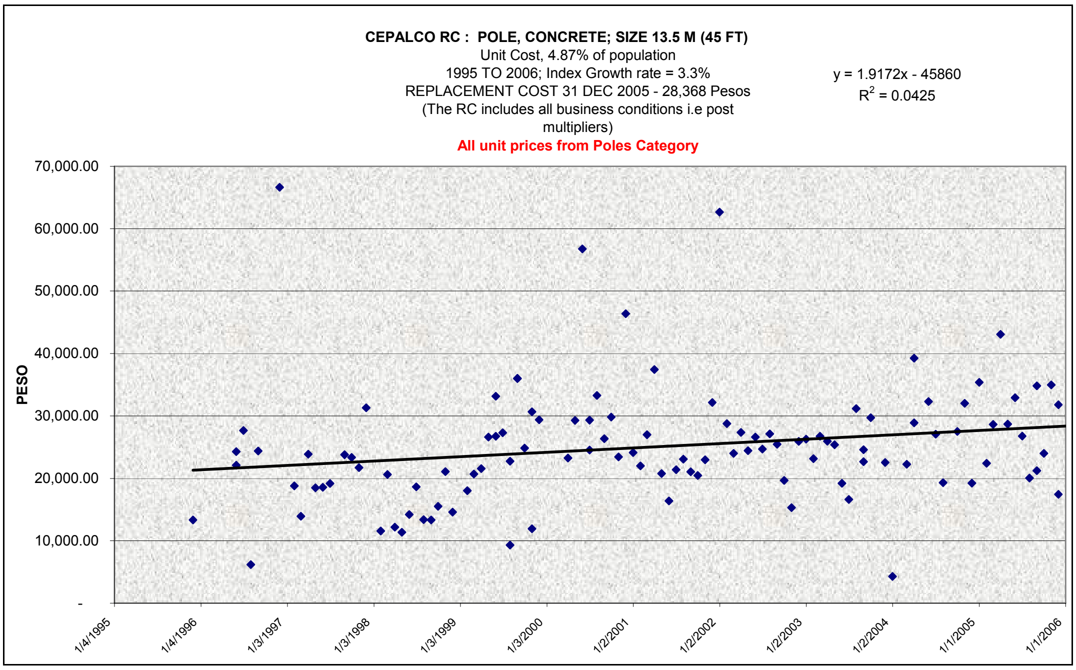
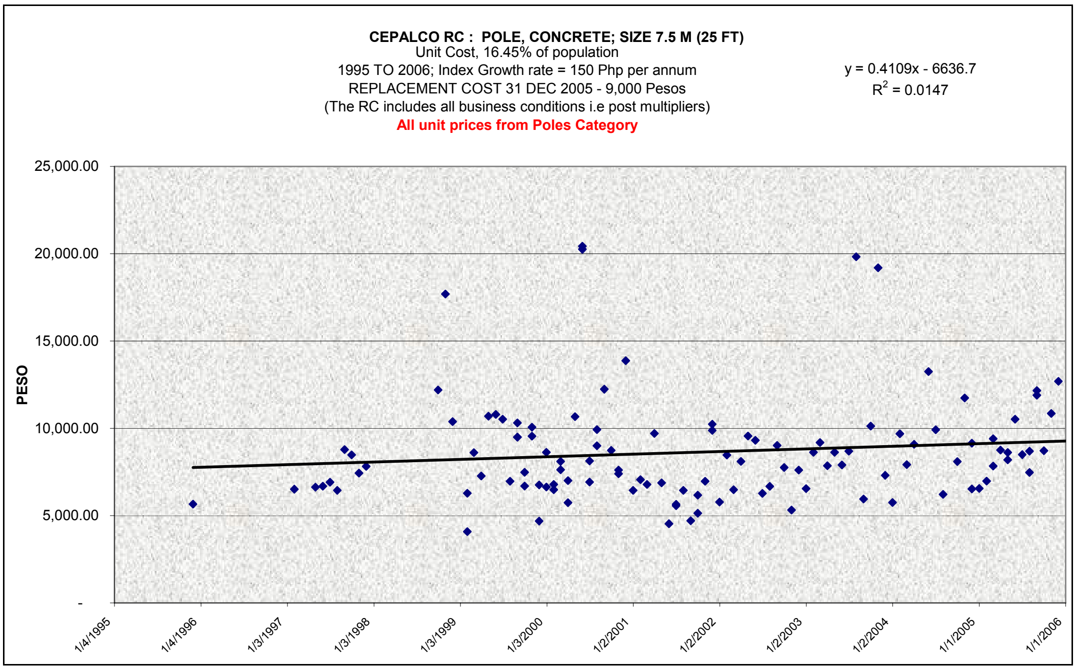


Figure 4: Concrete Pole – 25 ft



In summary the charts reveal the following trended replacement costs and annual replacement cost growth indexes as at Jun 2006:

Table 20: Standard Concrete Poles

Pole Type	Trended Replacement Cost at Jun, 2006 (Php)
POLE, CONCRETE; 23M (75 FT)	117,897
POLE, CONCRETE; SIZE 12.0 M (40 FT)	17,771
POLE, CONCRETE; SIZE 13.5 M (45 FT)	28,669
POLE, CONCRETE; SIZE 7.5 M (25 FT)	9,336

Building Block Verification of Replacement Costs

PB Associates has used a building block model to estimate the replacement cost of concrete poles. **These replacement cost estimates are based on conditions at a 'brownfield' site.**

Building block costs include materials, engineering and labour cost components.

The material cost includes a cost for guying. An overhead of 5% of raw material cost was applied to the pole category. This overhead cost included all design, procurement and transportation costs.

The labour cost for poles were based on a 7- man crew + vehicles (total daily rate of Php9,000). The installation times were set as per the following table:

Table 21 Efficient Installation Hours for Concrete Poles

Pole size	Installation Time
< 30ft	7 hours
40 ft	6 hours
45 ft	9 hours
50 ft	10 hours
55 ft	10 hours
75ft	13 hours

Table 22: Trended RCs Versus Building Block Costs

Pole Type	Trended RC at Jun 2006 (Php)	Building Block Cost at Jun 2006 (Php)	
POLE, CONCRETE; 23M (75 FT)		Material	107,230
		Installation Cost	14,625
	117,900	TOTAL	**121,855**
POLE, CONCRETE; 13.5 M (45 FT)		Material	31,760
		Installation Cost	6,750
	28,670	TOTAL	**38,510**
POLE, CONCRETE; 12.0 M (40 FT)		Material	17,610
		Installation Cost	6,750
	17,770	TOTAL	**24,360**
POLE, CONCRETE; 7.5 M (25 FT)		Material	6,090
		Installation Cost	5,625
	9,336	TOTAL	**11,715**

It can be seen that the building block costs are higher than the trended costs

Summary of Proposed Valuation Approach

PB Associates propose to value the common concrete poles using the trended costs as efficient replacement costs.

The analysis in the preceding section suggests the following replacement costs for Cepalco concrete poles:

Table 23: RCs for Concrete Poles

Concrete Poles	RC at Jun 2006 (Php)
POLE, CONCRETE; 23M (75 FT)	117,900
POLE, CONCRETE; 16.5M (55 FT)	44,900
POLE, CONCRETE; SIZE 13.5 M (45 FT)	28,670

Concrete Poles	RC at Jun 2006 (Php)
POLE, CONCRETE; SIZE 12.0 M (40 FT)	17,770
POLE, CONCRETE; SIZE 10.5 M (35 FT)	15,100
POLE, CONCRETE; SIZE 9.5 M (32 FT)	13,200
POLE, CONCRETE; SIZE 7.5 M (25 FT)	9,340
POLE, CONCRETE; SIZE 15.0 M (50 FT)	41,200
POLE, CONCRETE; SIZE 18.0 M (60 FT)	59,000
POLE, CONCRETE; SIZE 20.0 M (65 FT)	82,000
POLE, CONCRETE; SIZE 21.5 M (70 FT)	102,600
POLE, CONCRETE; SIZE 24.5 M (80 FT)	131,700

(ii) Standard Wood Poles

The historical costs of the common wood pole types listed in Table 19 were charted to determine a trended replacement cost and an overall weighted index:

Figure 5: Wood Pole – 25 ft

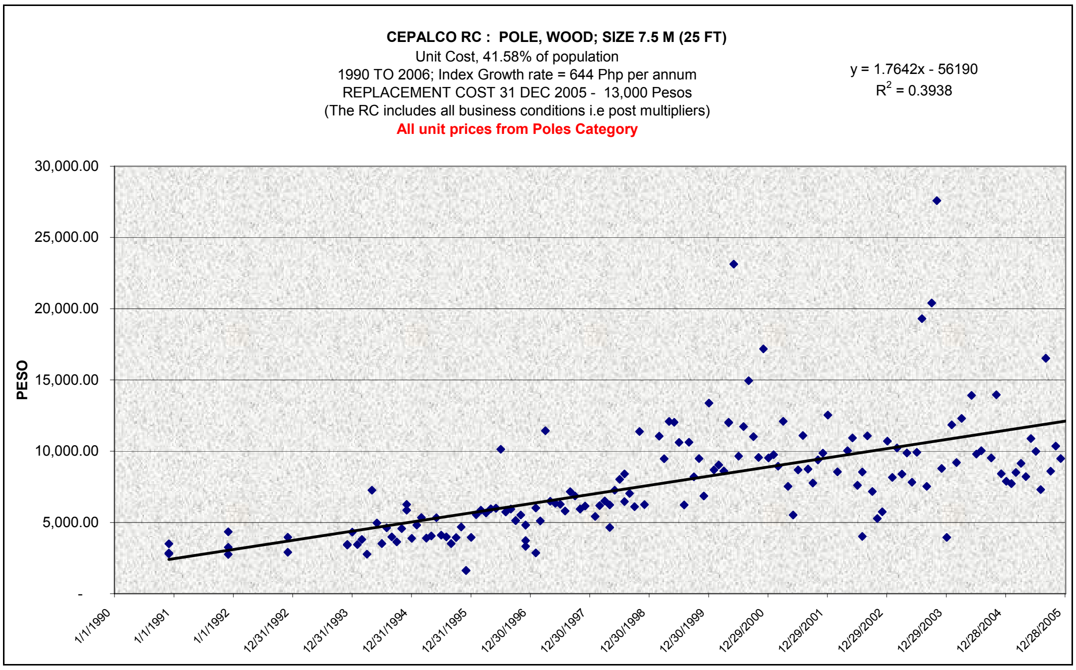


Figure 6: Wood Pole – 35 ft

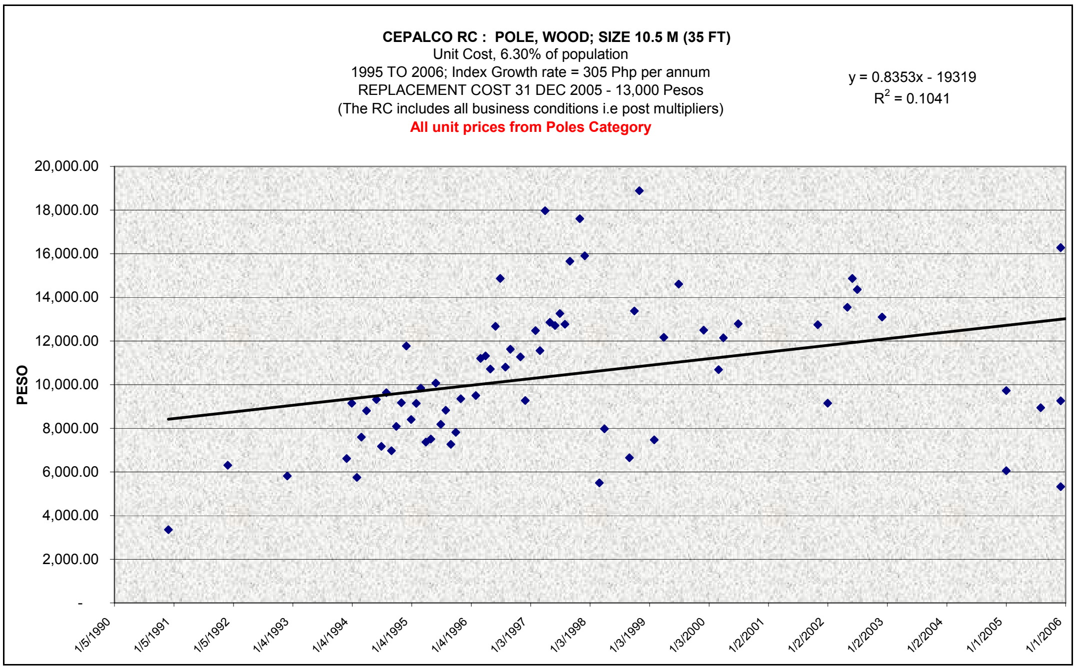
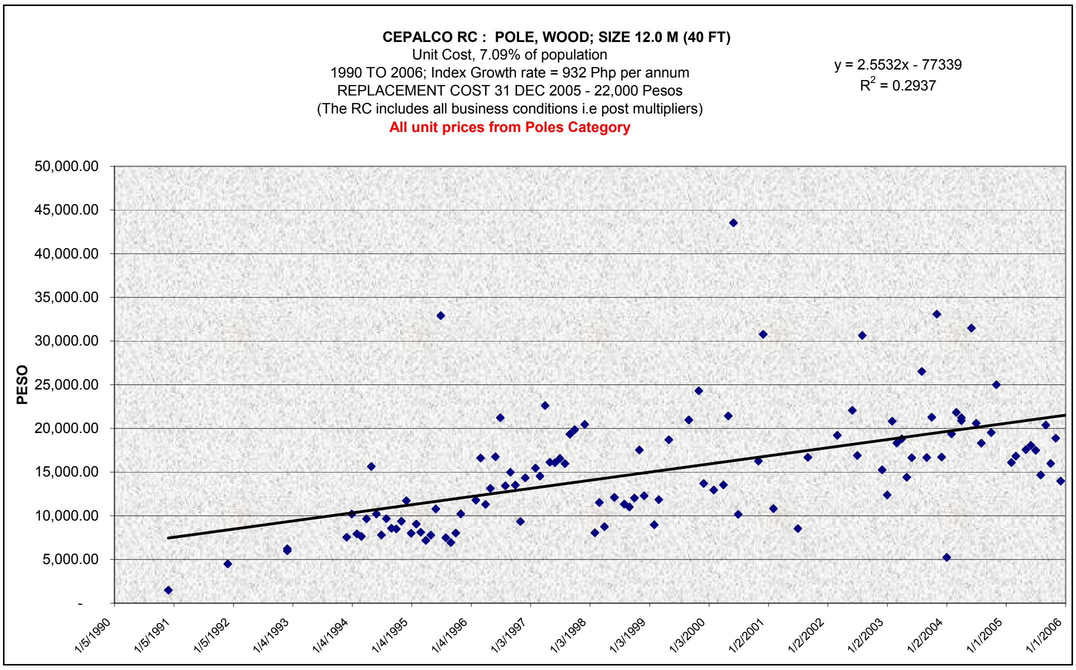


Figure 7: Wood Pole – 40 ft



In summary the charts reveal the following trended replacement costs and annual replacement cost growth indexes as at June 2006:

Table 24: Standard Wood Poles

Pole Type	Replacement Cost at Jun, 2006 (Php)
POLE, WOOD; SIZE 10.5 M (35 FT)	13,152
POLE, WOOD; SIZE 12.0 M (40 FT)	21,916
POLE, WOOD; SIZE 7.5 M (25 FT)	12,393

The weighted average annual RC growth index for wood poles is 640 Php per annum for these sizes.

Comparing the installed cost of the 40 ft wood pole (21,916PHp) with a concrete pole (17,771PHp) it is apparent that Cepalco's decision to employ concrete poles only is economically sound.

Accordingly, the modern equivalent asset (MEA) valuation method is suitable for valuing wood poles, whereby a wood pole is valued at the replacement cost of a concrete pole of equivalent size.

It is noted that depreciation is based on the age of the wood pole, but the replacement cost is that of an equivalent concrete pole.

(iii) Standard Steel Poles

The count of steel pole types amounts to only 1.5% of the total pole population. Due to the low count, historical cost trend charts were not produced for steel poles. Instead some analysis was carried out on recent purchase costs and reported installed costs.

The average installed cost reported by Cepalco during the last three years for the 25 ft steel pole was found to be as follows:

Table 25: 25 ft Steel Poles

Year	Number installed	Average Installed Cost
2003	40	Php13,702
2004	29	Php14,624
2005	105	Php14,197

PB Associates has determined that the weighted average annual RC growth index for steel poles is 4,000 Php for poles 40' and below, 10,000 Php for poles between 40' and up to 75', and 70,000 Php for poles taller than 75'.

These indices were determined by PB Associates analysis of the historical trend in installed costs for steel poles in Cepalco, Decorp and Meralco.

Summary of Proposed Valuation Approach

PB Associates propose to value steel poles using historical cost indexation using the abovementioned rates.

Overall Summary for Poles

Table 26: RCs / Indexes for Poles

Pole Description	RC Jun 06 (Php)	Index (Php per annum))
POLE, STEEL; 115 KV 32.0M OCTAGONAL		100,000
POLE, CONCRETE; 15.0 M (50 FT)	41,200	
POLE, CONCRETE; 16.5 M (55 FT)	44,900	
POLE, CONCRETE; 18.0 M (60 FT)	59,000	
POLE, CONCRETE; 20M (65 FT)	82,000	
POLE, CONCRETE; 21.4M (70 FT)	102,600	
POLE, CONCRETE; 23M (75 FT)	117,900	
POLE, CONCRETE; 24.5M (80FT)	131,700	
POLE, CONCRETE; SIZE 10.5 M (35 FT)	15,100	
POLE, CONCRETE; SIZE 12.0 M (40 FT)	17,770	
POLE, CONCRETE; SIZE 13.5 M (45 FT)	28,670	
POLE, CONCRETE; SIZE 7.5 M (25 FT)	9,340	
POLE, CONCRETE; SIZE 9.5 M (30 FT)	13,200	
POLE, STEEL, 24 M (80 FT)		70,000
POLE, STEEL, 75FT (22.50)		10,000
POLE, STEEL; 12.0 M (40 FT)		4,000
POLE, STEEL; 16.5 M (55 FT)		10,000
POLE, STEEL; 21.0 M (70 FT)		10,000
POLE, STEEL; 7.5 M (25 FT)		4,000
POLE, WOOD; SIZE 10.5 M (35 FT)	15,100	
POLE, WOOD; SIZE 12.0 M (40 FT)	17,770	
POLE, WOOD; SIZE 13.5 M (45 FT)	28,670	
POLE, WOOD; SIZE 15.0 M (50 FT)	41,200	
POLE, WOOD; SIZE 16.5 M (55 FT)	44,900	
POLE, WOOD; SIZE 18.0 M (60 FT)	59,000	
POLE, WOOD; SIZE 19.5 M (65 FT)	82,000	
POLE, WOOD; SIZE 21.0 M (70 FT)	102,600	
POLE, WOOD; SIZE 22.5 M (75 FT)	117,900	
POLE, WOOD; SIZE 24.0 M (80 FT)	131,700	
POLE, WOOD; SIZE 25.5 M (85 FT)	131,700	
POLE, WOOD; SIZE 7.5 M (25 FT)	9,340	
POLE, WOOD; SIZE 9.0 M (30 FT)	13,200	

(v) Pole Top Hardware

Cepalco has 115kV, 69kV, 34.5kV and 13.8kV pole tops in use. Pole top hardware costs were calculated using recent data (March ’06) provided by Cepalco for typical overhead line projects at various voltage levels.

Table 27: Pole Top Hardware

Pole Top Hardware	Trended Replacement Cost at Jun, 2006 (Php)
138 kV Pole Top Hardware – 3 phase	86,100
69 kV Pole Top Hardware – 3 phase	92,000
34.5 kV Pole Top Hardware – 3 phase	11,400
34.5 kV Pole Top Hardware – 2 phase	3,600
13.8 kV Pole Top Hardware – 3 phase	6,400
13.8 kV Pole Top Hardware – 2 phase	1,800

A6 & A7 – OVERHEAD CONDUCTORS & DEVICES (DISTRIBUTION)

(i) Overhead Conductors

There are a large number of overhead conductor types in use ranging from 138kV down to 220V. The 220V overhead conductor is used for low voltage services and streetlights and is dealt with in subcategory A15.

The assets in use for all voltage except 220V are shown in Table 28:

Table 28: Assets In Use

Cepalco Classification	Standard Wire Description	Sq mm
2-023-101	WIRE, AAC, #8 AWG, SOLID	8.5
2-023-102	WIRE, AAC, #8 AWG, SOLID	8.5
2-023-103	AAC NO. 6 AWG SOLID	13.3
2-023-104	AAC NO. 4 AWG SOLID	21.5
2-023-111	AAC NO. 4 AWG SOLID	21.5
2-023-112	AAC NO. 4 STRANDED, INSULATED	21.5
2-023-113	AAC NO. 2 STRANDED, INSULATED	33.5
2-023-114	AAC NO. 1/10 STRANDED, INSULATED	54
2-023-116	AAC NO. 3/0 STRANDED, INSULATED	85
2-023-117	AAC NO. 4/0 STRANDED, INSULATED	106
2-023-118	AAC NO. 336.4 STRANDED, INSULATED	170
2-023-201	WIRE, ACSR, #6 AWG, WP	13.3
2-023-202	WIRE, ACSR, #4 AWG, WP	21.5
2-023-203	WIRE, ACSR, #2 AWG, WP	33.5
2-023-204	WIRE, ACSR, #1/0 AWG, WP	54
2-023-206	WIRE, ACSR, #3/0 AWG, WP	85
2-023-207	WIRE, ACSR, #4/0 AWG, WP	106
2-023-301	WIRE, ACSR, #2 AWG, BARE	33.5
2-023-302	WIRE, ACSR, #2 AWG, BARE	33.5
2-023-303	WIRE, ACSR, #1/0 AWG, BARE	54

Cepalco Classification	Standard Wire Description	Sq mm
2-023-306	WIRE, ACSR, #4/0 AWG, BARE	106
2-023-307	WIRE, ACSR, #336.4MCM AWG, BARE	170
2-023-308	WIRE, ACSR, #477MCM AWG, BARE	240
2-023-310	WIRE, ACSR, #795MCM AWG, BARE	400
2-024-102	WIRE, CU, #8 AWG SOLID, WP	8.5
2-024-103	WIRE, CU, #6 AWG, SOLID, WP	13.3
2-024-105	WIRE, CU, #4 AWG, SOLID, WP	21.5
2-024-113	WIRE, CU, #1/0 AWG, STRANDED, WP	54
2-024-203	10 Copper Solid, Insulated, TW	5
2-024-204	8 Copper Solid, Insulated, TW	8.5
2-024-213	WIRE, CU, #10 AWG, STRANDED, THHN, PHELP DODGE	5
2-024-215	WIRE, CU, #6 AWG, STRANDED, TW	13.3
2-024-216	WIRE, CU, #4 AWG, STRANDED, TW	21.5
2-024-217	WIRE, CU, #2 AWG, STRANDED, TW	33.5
2-024-218	WIRE, CU, #1/0 AWG, STRANDED, TW	54
2-024-219	WIRE, CU, #2/0 AWG, STRANDED, TW	67
2-024-220	WIRE, CU, #4/0 AWG, STRANDED, TW	106
2-024-221	WIRE, CU, #4/0 AWG, STRANDED, TW	106
2-024-222	WIRE, CU, #250 MCM AWG, STRANDED, TW	126
2-024-223	WIRE, CU, #250 MCM AWG, STRANDED, TW	126
2-024-224	WIRE, CU, #500 MCM AWG, STRANDED, TW	240
2-024-225	WIRE, CU, #750 MCM AWG, STRANDED, TW	400
2-024-313	WIRE, CU, #750 MCM AWG, STRANDED, TW	400
2-024-322	WIRE, CU, #750 MCM AWG, STRANDED, TW	400
2-024-401	WIRE, CU, #2 AWG, SD, BARE	33.5
2-024-402	WIRE, CU, #2 AWG, SD, BARE	33.5
2-024-403	WIRE, CU, #1/0 AWG, SD	54
2-024-404	WIRE, CU, #2/0 AWG, SD	67

Many of these conductors have a relatively small amount in use. The common assets by count are as follows:

Table 29: Assets In Use

Overhead Conductor	Count (km)	% by Count	% by Value
WIRE, ACSR, #2 AWG, BARE	1,045	21.36%	9.07%
WIRE, ACSR, #1/0 AWG, BARE	498	10.18%	6.83%
WIRE, ACSR, #336.4MCM AWG, BARE	233	4.76%	16.37%
WIRE, ACSR, #477MCM AWG, BARE	100	2.03%	8.34%
WIRE, ACSR, #795MCM AWG, BARE	179	1.99%	8.07%

Overhead Conductor	Count (km)	% by Count	% by Value
WIRE, CU, #1/0 AWG, STRANDED, TW	41	0.85%	7.09%
	Total	86.8%	83.8%

There is one conductor that is used predominantly for 220V LV Services, and for Streetlights and Signals. For the purpose of historical cost trending the data pertaining to this conductor size has been combined.

Table 30: Assets In Use - 600V only

DWRG Category	WIRE, AAC, #8 AWG, SOLID	Count (km)	% by Count for DWRG Category	% by Value for DWRG Category
A06	Overhead Conductor	282	5.76%	1.33%
A015	LV Services, Streetlights, Signals	2,692	91.15%	10.23%

The historical costs of the common conductor types listed in Table 28 and the combined historical costs of the AAC conductor in Table 29 were charted to determine a trended replacement cost and an overall weighted index:

Figure 8: Wire, ACSR, #2 AWG BARE

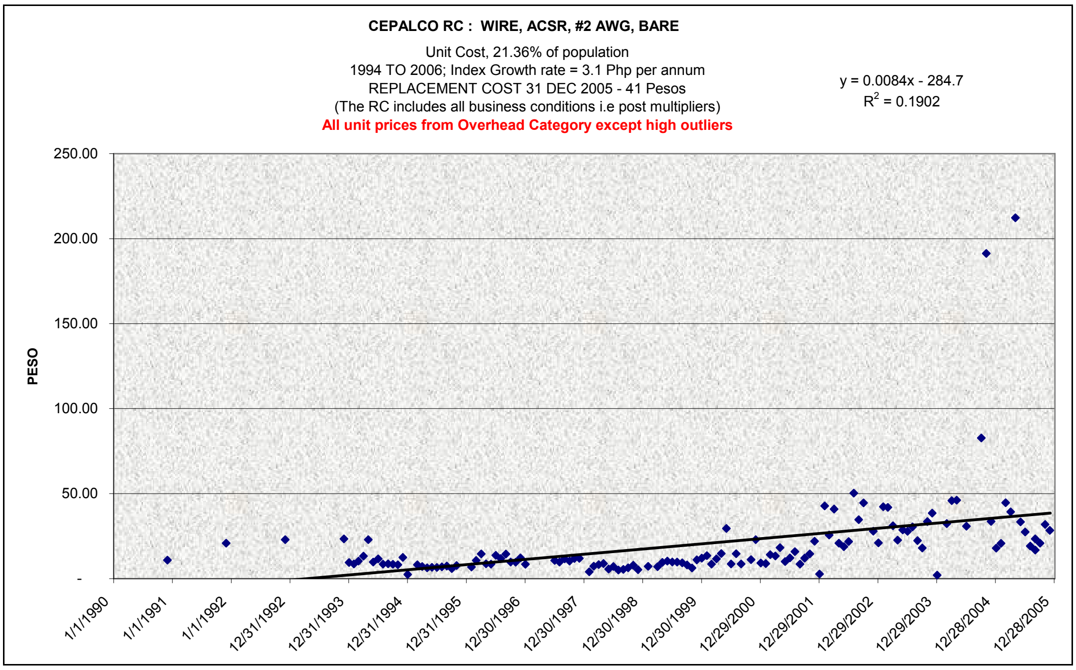


Figure 9: Wire, ACSR, #1/0 AWG BARE

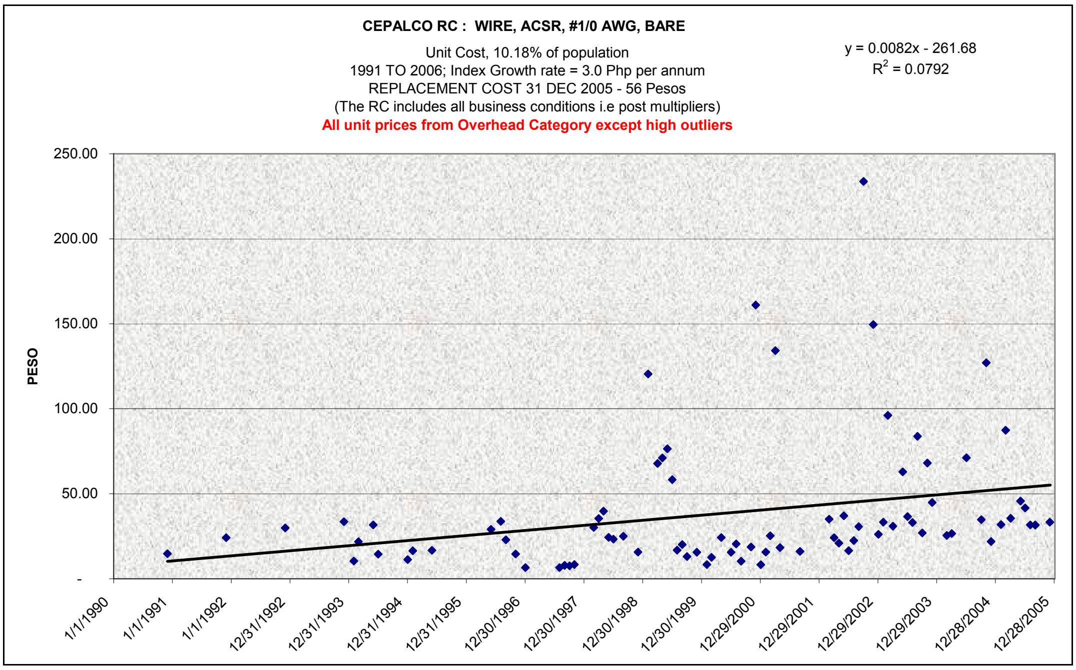


Figure 10: Wire, ACSR, #336.4 MCM AWG, BARE

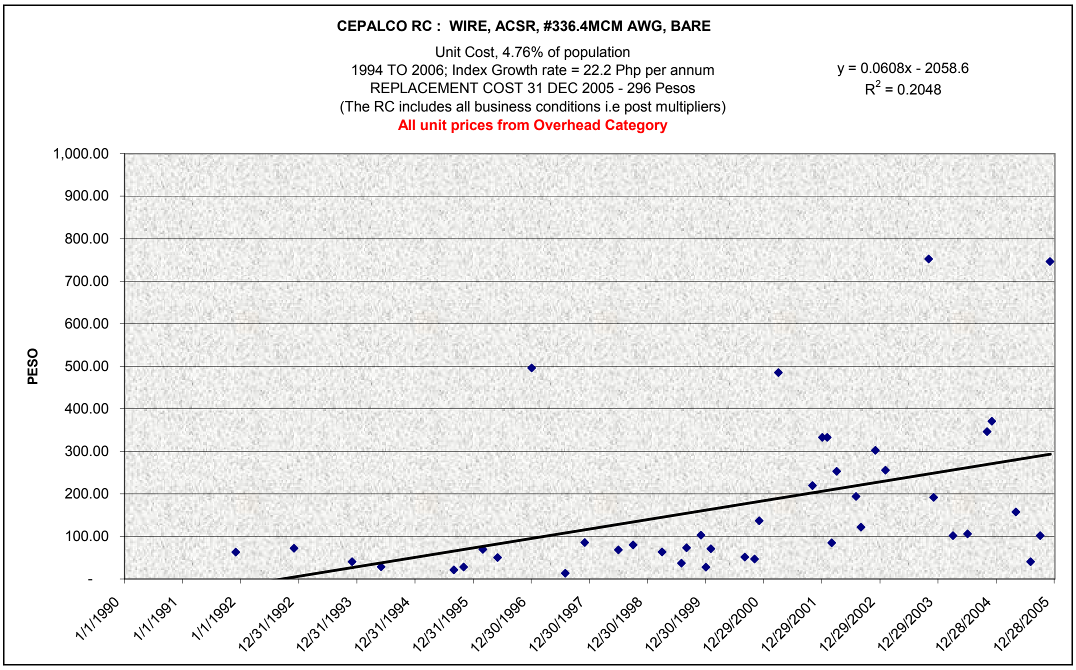


Figure 11: Wire, ACSR, #477 MCM AWG, BARE

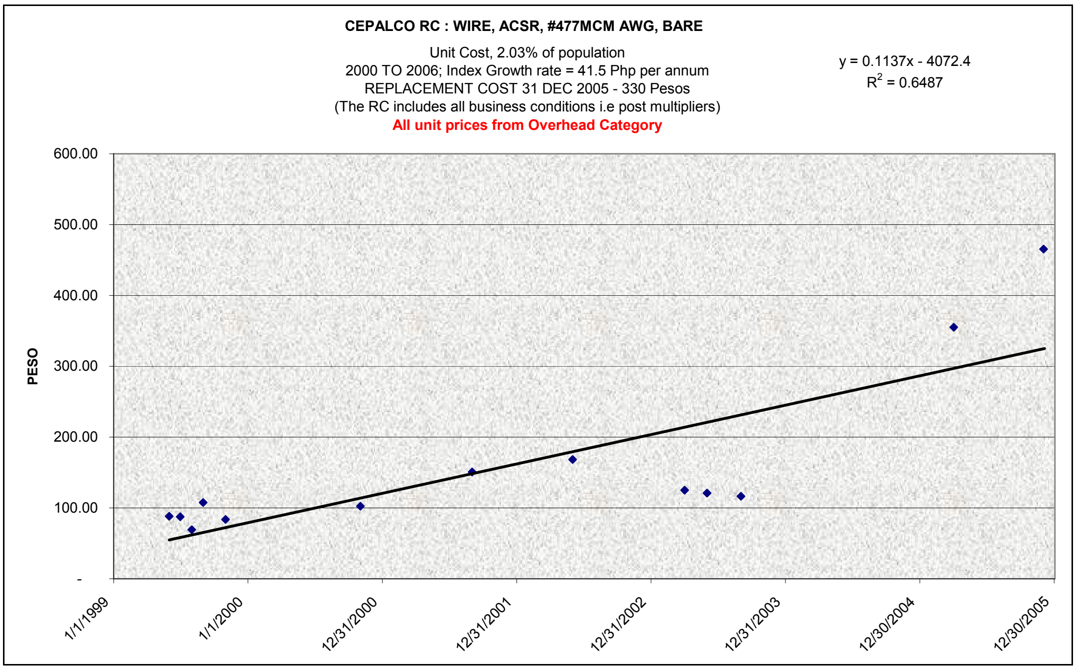


Figure 12: Wire, ACSR, #795 MCM AWG WP

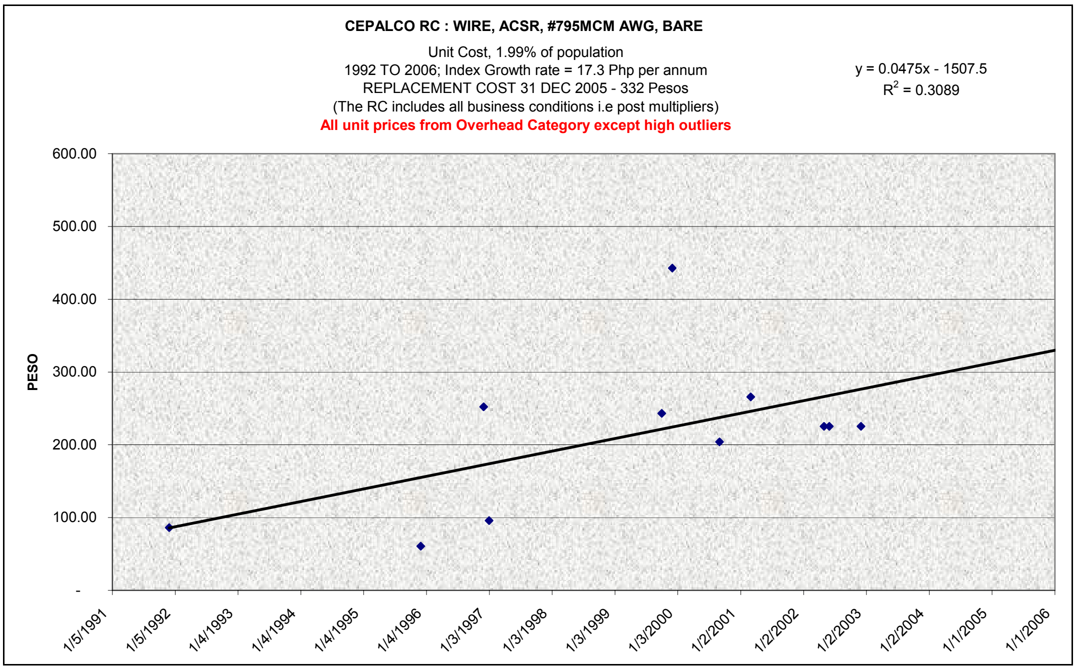


Figure 13: Wire, CU, #1/0 AWG, STRANDED, TW

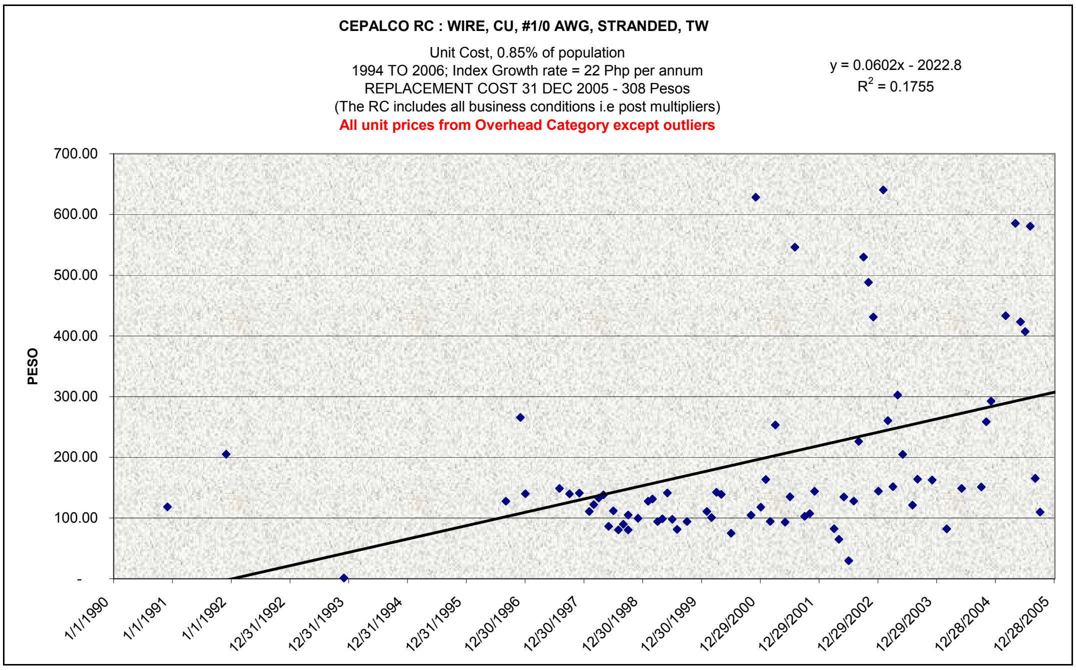
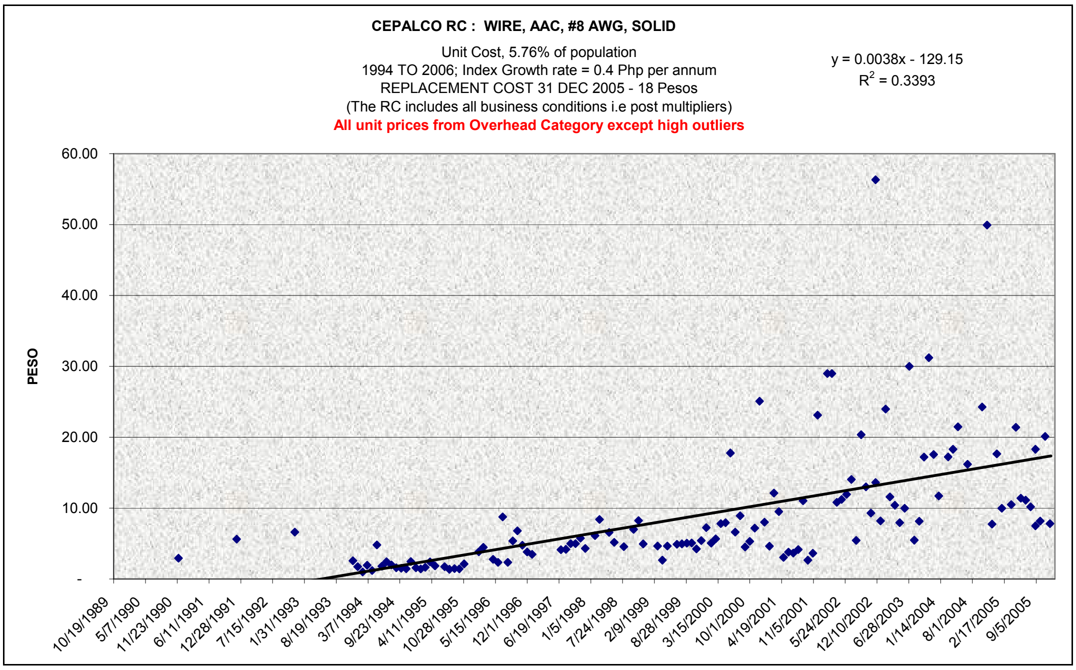


Figure 14: Wire, AAC, #8 AWG, SOLID



By interpolation, the charts reveal the following trended replacement costs and annual replacement cost growth indexes as at June 2006:

Table 31: RCs for Standard Conductor Sizes

DWRG Category	Standard Line Conductor	Sq mm	Trended Replacement Cost at June, 2006 (Php)	RC Growth (Php per annum)
A06	WIRE, ACSR, #2 AWG, BARE	33.5	47	3.1
A06	WIRE, ACSR, #1/0 AWG, BARE	54	61	3.0
A06	WIRE, ACSR, #336.4MCM AWG, BARE	170	304	22.2
A06	WIRE, ACSR, #477MCM AWG, BARE	240	417	41.5
A06	WIRE, ACSR, #795MCM AWG, BARE	400	304	17.3
A06	WIRE, CU, #1/0 AWG, STRANDED, TW	54	2,963	22
A06	WIRE, AAC, #8 AWG, SOLID	8.5	11	0.4
A15	WIRE, AAC, #8 AWG, SOLID	8.5	9	0.4

The weighted average annual RC growth index for conductors varies according to material type and capacity of conductor:

Table 32: Weighted Indexes for Conductor Material

Weighted Index	RC growth (Php per annum)
All Conductors	3.22
ACSR – Aluminum Steel Reinforced	4.97
Copper	21.97
AAC – All Aluminum	0.44

The conductor material indexes are scaled according to the sq mm size of conductor.

Building Block Verification of Replacement Costs

PB Associates has used a building block model to estimate the replacement cost of overhead conductor. As discussed in Section 3.3, the material costs have been struck based on long term average prices (adjusted to remove the sharp increase in commodity prices of metals since mid-2005). The labour cost is based on a 7-man crew (daily rate of Php9,000). Efficiency in running overhead conductor was based on average meters per hour installed as shown in the following table:

Table 33: Installation of Overhead Conductor

Conductor Size	Installation Time
Less than 54 sq mm	200 meters per hour
54 sq mm to 170 sq mm	150 meters per hour
More than 170 sq mm	100 meters per hour

Building block costs include materials, engineering and labour cost components. The material cost contains a binding wire cost. An overhead of 5% of raw material cost was applied to the overhead conductor category. This overhead covers all design and procurement costs.

Table 34: Trended RCs Versus Building Block Costs

Conductor Type	Trended RC at June 01, 2006 (Php/m)	Building Block Cost at June 01, 2006 (Php/m)	
WIRE, AAC, #8 AWG, SOLID		Material	10.5
		Installation Cost	45
	18	TOTAL	**55.5**
WIRE, ACSR, #2 AWG, BARE		Material	26
		Installation Cost	45
	47	TOTAL	**71**
WIRE, ACSR, #1/0 AWG, BARE		Material	40
		Installation Cost	45
	61	TOTAL	**85**
WIRE, ACSR, #336.4MCM AWG, BARE		Material	130
		Installation Cost	60
	304	TOTAL	**190**
WIRE, ACSR, #477MCM AWG, BARE		Material	142
		Installation Cost	90
	416	TOTAL	**232**
WIRE, ACSR, #795MCM AWG, BARE		Material	315
		Installation Cost	90
	304	TOTAL	**405**
WIRE, CU, #1/0 AWG, STRANDED, TW		Material	266
		Installation Cost	45
	320	TOTAL	**311**

Where the trended cost appears to be inaccurate, the building block cost has been adopted. This is because it is likely that there are outlier costs in the asset register. In such instances, further analysis was carried out to check that the building block cost met with the 'interpolated' cost when compared to other conductor sizes.

Summary of Proposed Valuation Approach

PB Associates propose to value the standard overhead conductor using current replacement cost method and the non-standard conductors using indexation of historical costs. The indexes are applied according to the material type i.e. Cu, ACSR, or AAC, as shown in Table 32 and scaled according to the sq mm size of each 'non-standard' conductor.

The analysis in the preceding section suggests the following RCs and indexes for Cepalco overhead conductors:

Table 35 RCs / Indexes for Overhead Conductors

Cepalco Classification	Standard Conductor	Sq mm	RC Jun 06 (Php)	Index (Php per annum))
2-023-101	WIRE, AAC, #8 AWG, SOLID	8.5	15	
2-023-103	AAC NO. 6 AWG SOLID	21.5		1.4
2-023-104	AAC NO. 4 AWG SOLID			
2-023-111	AAC NO. 4 AWG SOLID			
2-023-112	AAC NO. 4 STRANDED, INSULATED			
2-023-113	AAC NO. 2 STRANDED, INSULATED			
2-023-114	AAC NO. 1/10 STRANDED, INSULATED			
2-023-116	AAC NO. 3/0 STRANDED, INSULATED			
2-023-117	AAC NO. 4/0 STRANDED, INSULATED			
2-023-118	AAC NO. 336.4 STRANDED, INSULATED			
2-023-201	WIRE, ACSR, #6 AWG, WP			
2-023-202	WIRE, ACSR, #4 AWG, WP			
2-023-203	WIRE, ACSR, #2 AWG, WP	33.5	65	
2-023-204	WIRE, ACSR, #1/0 AWG, WP	54	87	
2-023-206	WIRE, ACSR, #3/0 AWG, WP			
2-023-207	WIRE, ACSR, #4/0 AWG, WP	106		5
2-023-301	WIRE, ACSR, #2 AWG, BARE			
2-023-302	WIRE, ACSR, #2 AWG, BARE			
2-023-303	WIRE, ACSR, #1/0 AWG, BARE			
2-023-306	WIRE, ACSR, #4/0 AWG, BARE			
2-023-307	WIRE, ACSR, #336.4MCM AWG, BARE	170	214	
2-023-308	WIRE, ACSR, #477MCM AWG, BARE	240	352	
2-023-310	WIRE, ACSR, #795MCM AWG, BARE	400	496	
2-024-102	WIRE, CU, #8 AWG SOLID, WP			
2-024-103	WIRE, CU, #6 AWG, SOLID, WP			
2-024-105	WIRE, CU, #4 AWG, SOLID, WP			
2-024-113	WIRE, CU, #1/0 AWG, STRANDED, WP			
2-024-203	10 Copper Solid, Insulated, TW			
2-024-204	8 Copper Solid, Insulated, TW			
2-024-213	WIRE, CU, #10 AWG, STRANDED, THHN, PHELP DODGE			
2-024-215	WIRE, CU, #6 AWG, STRANDED, TW			

Cepalco Classification	Standard Conductor	Sq mm	RC Jun 06 (Php)	Index (Php per annum))
2-024-216	WIRE, CU, #4 AWG, STRANDED, TW			
2-024-217	WIRE, CU, #2 AWG, STRANDED, TW	33.5		22
2-024-218	WIRE, CU, #1/0 AWG, STRANDED, TW	54	428	
2-024-219	WIRE, CU, #2/0 AWG, STRANDED, TW			
2-024-220	WIRE, CU, #4/0 AWG, STRANDED, TW	106		22
2-024-221	WIRE, CU, #4/0 AWG, STRANDED, TW	106		22
2-024-222	WIRE, CU, #250 MCM AWG, STRANDED, TW			
2-024-223	WIRE, CU, #250 MCM AWG, STRANDED, TW			
2-024-224	WIRE, CU, #500 MCM AWG, STRANDED, TW			
2-024-225	WIRE, CU, #750 MCM AWG, STRANDED, TW			
2-024-313	WIRE, CU, #750 MCM AWG, STRANDED, TW			
2-024-322	WIRE, CU, #750 MCM AWG, STRANDED, TW			
2-024-401	WIRE, CU, #2 AWG, SD, BARE	33.5		22
2-024-402	WIRE, CU, #2 AWG, SD, BARE	33.5		22
2-024-403	WIRE, CU, #1/0 AWG, SD			
2-024-404	WIRE, CU, #2/0 AWG, SD	67		22

The shaded rows are conductors that were allocated to the next nearest conductor size.

(ii) Fuses

Cepalco has 195 off 34.5kV Power Fuses – 100 E Amp rated.

Building Block Verification of Replacement Costs

The range of escalated RCs can be correlated with current equipment prices observed in the market recently.

The replacement cost for this item is £104 or Php10,000.

Summary of Proposed Valuation Approach

PB Associates propose to value fuses using current replacement cost method. The analysis in the preceding section suggests the following RCs for Cepalco High Voltage fuses.

Table 36: RC for Fuses

Fuses	RC for Jun 06 (Php)
FUSE, 34.5 KV; 100 E AMP	10,000

(iii) Line Switches

Cepalco register has one line switch, (13.8kV interrupter). The replacement cost for this item is £825 or Php79,200.

(iv) Circuit Reclosers

Cepalco has 21 circuit reclosers.

Table 37: Assets In Use

Circuit Reclosers	Count	Year Installed	Historical Cost (Php)	Historical Cost per unit (Php)	Forecast Current RC per unit (Php)[1]
CIRCUIT RECLOSER, 13.8 KV; 70AMP, 3-PHASE	1	1993	78,838	78,838	240,838
	2	1990	237,235	118,618	316,618
CIRCUIT RECLOSER, 13.8KV; 200AMP; 3-PHASE	3	1990	117,289	39,096	437,096
CIRCUIT RECLOSER, 13.8KV; 400AMP; 3-PHASE	1	1990	292,225	292,225	704,725
CIRCUIT RECLOSER, 34.5kV, 25AMP, 3-PHASE	4	1992	928,794	232,198	406,198
	1	1991	199,498	199,498	385,498
	2	1997	1,242,450	620,975	734,975
	2	1990	208,025	104,012	302,012
CIRCUIT RECLOSER, 34.5kV, 140AMP, 3-PHASE	5	1990	807,356	161,471	573,971

[1] These costs were derived using indexes of 12,000 and 25,000Php per annum for Circuit Reclosers less than and including 200A rating, and greater than 200A rating respectively. The high 1997 cost item is excluded as it is likely to be due to the impact of the Asian crisis.

Building Block Verification of Replacement Costs

The range of escalated RCs can be correlated with current equipment prices observed in the market recently. The range of prices is likely to reflect the business conditions associated with each installation.

For example:

An indicative market price for a 13.8kV 560A 3-Ph Recloser is 760,000 Php. Adding a 22% installation cost, the RC for Cepalco would be 934,000 Php. The RC of a 560A Recloser would be ~ 910,000 Php.

The market price of a 34.5kV 560A 3-Ph Recloser is 1,240,000 Php. The RC for Cepalco would be 1,525,000 Php. The RC of a 34.5kV 560A 3-Ph Recloser would be ~ 1,400,000 Php.

Summary of Proposed Valuation Approach

PB Associates propose to value Circuit Reclosers using current replacement cost method.

The analysis in the preceding section suggests the following RCs for Cepalco Circuit Reclosers.

Table 38: RC for Circuit Reclosers

Circuit Reclosers	RC for Jun 06 (Php)
CIRCUIT RECLOSER, 13.8 KV; 70AMP, 3-PHASE	280,000
CIRCUIT RECLOSER, 13.8KV; 200AMP; 3-PHASE	440,000
CIRCUIT RECLOSER, 13.8KV; 400AMP; 3-PHASE	700,000
CIRCUIT RECLOSER, 34.5kV, 25AMP, 3-PHASE	365,000
CIRCUIT RECLOSER, 34.5kV, 140AMP, 3-PHASE	575,000

A8 & A9 – UNDERGROUND CONDUITS

Cepalco does not have any underground conduits in their asset base.

A10 & A11 – UNDERGROUND CONDUCTORS AND DEVICES

Cepalco does not have any underground conductors or devices in their asset base.

A12 & A13 – LINE TRANSFORMERS

(i) Line Transformers (DTs)

Cepalco has 1225 distribution line transformers. Of these, 407 are rated at 13.8kV (33%) and 818 are rated at 34.5kV (66%).

A full breakdown is provided in Table 39.

Table 39: Assets In Use

Line Transformer	Count	% by Count	% by Value
DT, 100KVA, 13.8KV	4	4.44%	7.00%
DT, 100KVA, 34.5KV	1	7.04%	12.20%
DT, 150KVA, 13.8KV	38	0.46%	0.84%
DT, 15KVA, 13.8KV	125	0.14%	0.13%
DT, 15KVA, 34.5KV	198	1.96%	1.08%
DT, 167KVA, 13.8KV	13	4.73%	5.25%
DT, 167KVA, 34.5KV	4	2.70%	4.91%
DT, 25KVA, 13.8KV	55	7.47%	3.92%
DT, 25KVA, 34.5KV	133	14.47%	9.50%
DT, 37.5KVA, 34.5KV	76	0.04%	0.04%
DT, 50KVA, 13.8KV	210	12.83%	9.40%
DT, 50KVA, 34.5KV	407	43.55%	45.60%
DT, 50KVA, 2.4KV	1	0.14%	0.12%
DT, 75KVA, 34.5KV	361	0.04%	0.02%
Grand Total	1,225	100%	100%

(ii) Special Voltage Transformers (SVTs)

Cepalco has 2,809 special voltage transformers (SVT) used for voltage transformation. These DTs are of a similar size and capacity to the line DTs, and installation costs are also similar. Accordingly, it is reasonable to value SVT's using common replacement costs of the nearest line transformer type. Table 40 is an allocation table for mapping the SVT to a standard line DT for the purpose of replacement cost determination.

Table 40: Special Voltage Transformers In Use

SVT in ODRC Register	Allocation to Standard DT Type	Count of SVTs	% by Total Count of SVTs	% by Total Value of SVTs
DT, 50KVA; 2.4KV-240/120V; 1PH	DT, 50KVA, 2.4KV	4	0.14%	0.42%
DT, 25KVA; 13.8KV-240/480V; 1PH	DT, 25KVA, 13.8KV	1	0.04%	0.29%
DT, 25KVA; 13.8KV-138.5/277V; 1PH	DT, 25KVA, 13.8KV	38	1.35%	1.50%
DT, 50KVA; 13.8KV-138.5/277V; 1P H	DT, 50KVA, 13.8KV	49	1.74%	1.54%
DT, 100KVA; 13.8KV-138.5/277V; 1PH	DT, 100KVA, 13.8KV	22	0.78%	2.92%
DT, 15KVA; 13.8KV-240/120V; 1PH	DT, 15KVA, 13.8KV	4	0.14%	0.27%
DT, 25KVA; 13.8KV-240/120V; 1PH	DT, 25KVA, 13.8KV	171	6.09%	3.50%
DT, 50KVA; 13.8KV-240/120V; 1PH	DT, 50KVA, 13.8KV	291	10.36%	7.31%
DT, 50KVA; 13.8KV-240/480V; 1PH	DT, 50KVA, 13.8KV	3	0.11%	0.26%
DT, 100KVA; 13.8KV-240/120V; 1PH	DT, 100KVA, 13.8KV	95	3.38%	8.37%
DT, 100KVA; 13.8KV-240/120V; 1PH	DT, 100KVA, 13.8KV	8	0.28%	1.59%
DT, 167KVA; 13.8KV-240/120V; 1PH	DT, 167KVA, 13.8KV	133	4.73%	8.36%
DT, 167KVA; 34.5KV-240/480V; 1PH	DT, 167KVA, 34.5KV	3	0.11%	0.31%
DT, 15KVA; 34.5KV-240/120V; 1PH	DT, 15KVA, 34.5KV	55	1.96%	2.12%
DT, 25KVA; 34.5KV-240/120V; 1PH	DT, 25KVA, 34.5KV	407	14.49%	9.59%
DT, 37.5KVA; 34.5KV-240/120V; 1PH	DT, 37.5KVA, 34.5KV	1	0.04%	0.31%
DT, 50KVA; 34.5KV-240/120V; 1PH	DT, 50KVA, 34.5KV	890	31.68%	12.09%
DT, 50KVA; 34.5KV-138.5/277V	DT, 50KVA, 34.5KV	3	0.11%	0.28%
DT, 50KVA; 13.8KV-240/480V; 1PH	DT, 50KVA, 13.8KV	18	0.64%	0.26%
DT, 50KVA; 34.5KV-120/240X138.5/277V	DT, 50KVA, 34.5KV	328	11.68%	9.40%
DT, 75KVA; 34.5KV-240/120V; 1PH	DT, 75KVA, 34.5KV	1	0.04%	0.14%
DT, 100KVA; 34.5KV-240/120V; 1PH	DT, 100KVA, 34.5KV	83	2.95%	3.14%
DT, 100KVA; 34.5KV-138.5/277V; 1PH	DT, 100KVA, 34.5KV	18	0.64%	3.55%
DT, 100KVA; 34.5KV-240/480V; 1PH	DT, 100KVA, 34.5KV	1	0.04%	0.53%
DT, 100KVA; 34.5KV-120/240X138.5/277V	DT, 100KVA, 34.5KV	96	3.42%	11.10%
DT, 150KVA; 34.5KV-240/480V; 1PH	DT, 150KVA, 34.5KV	5	0.18%	0.24%
DT, 150KVA; 34.5KV-138.5/277V; 1PH	DT, 150KVA, 34.5KV	8	0.28%	1.47%
DT, 167KVA; 34.5KV-138.5/277V; 1PH	DT, 167KVA, 34.5KV	19	0.68%	0.69%

SVT in ODRC Register	Allocation to Standard DT Type	Count of SVTs	% by Total Count of SVTs	% by Total Value of SVTs
DT, 167KVA; 34.5KV-120/240X138.5/277V	DT, 167KVA, 34.5KV	33	1.17%	7.61%
DT, 167KVA; 34.5KV- 120/240X138.5/277V	DT, 167KVA, 34.5KV	21	0.75%	0.80%
	Grand Total	2,809	100%	100%

(iii) Historical Cost Trending

After allocation, PB Associates trended the historical costs for the **combined** count of standard line transformers and SVTs for the standard categories shown as shaded rows in Table 39.

The historical costs were drawn from Cepalco's verified ODRC asset register.

Figure 15: DT – 25kVA, 13.8kV

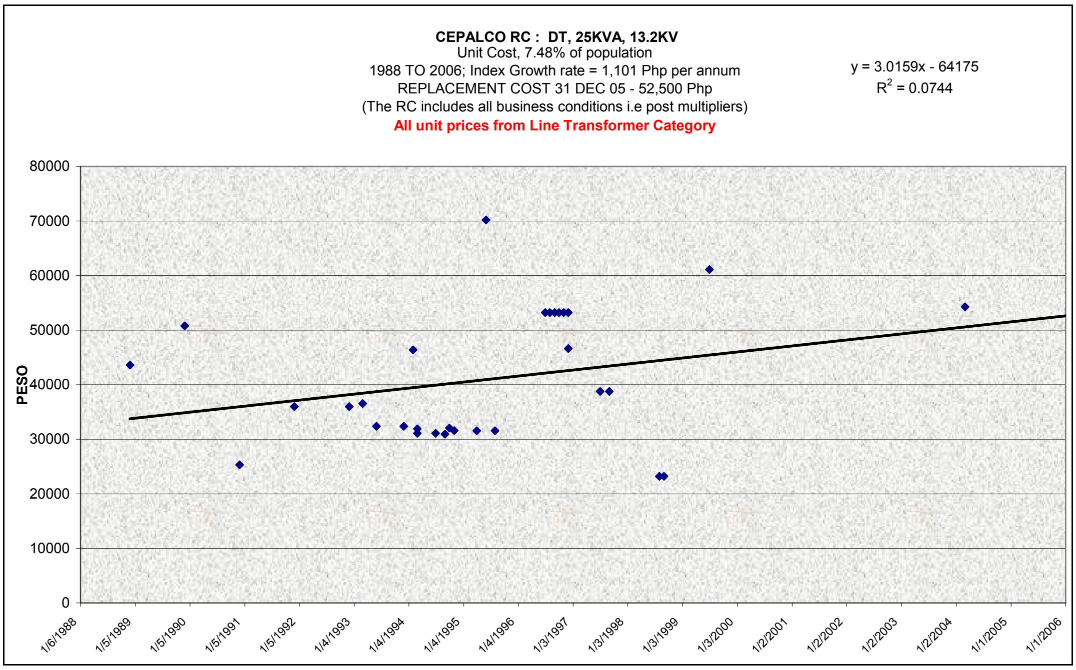


Figure 16: DT – 50kVA, 13.8kV

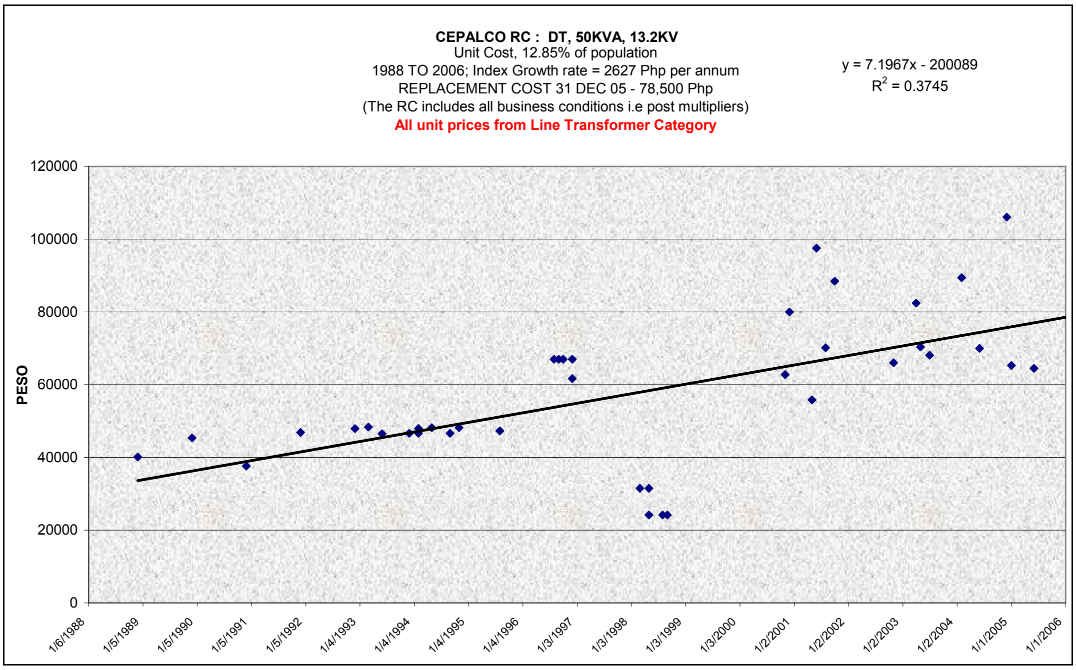


Figure 17: DT – 100kVA, 13.8kV

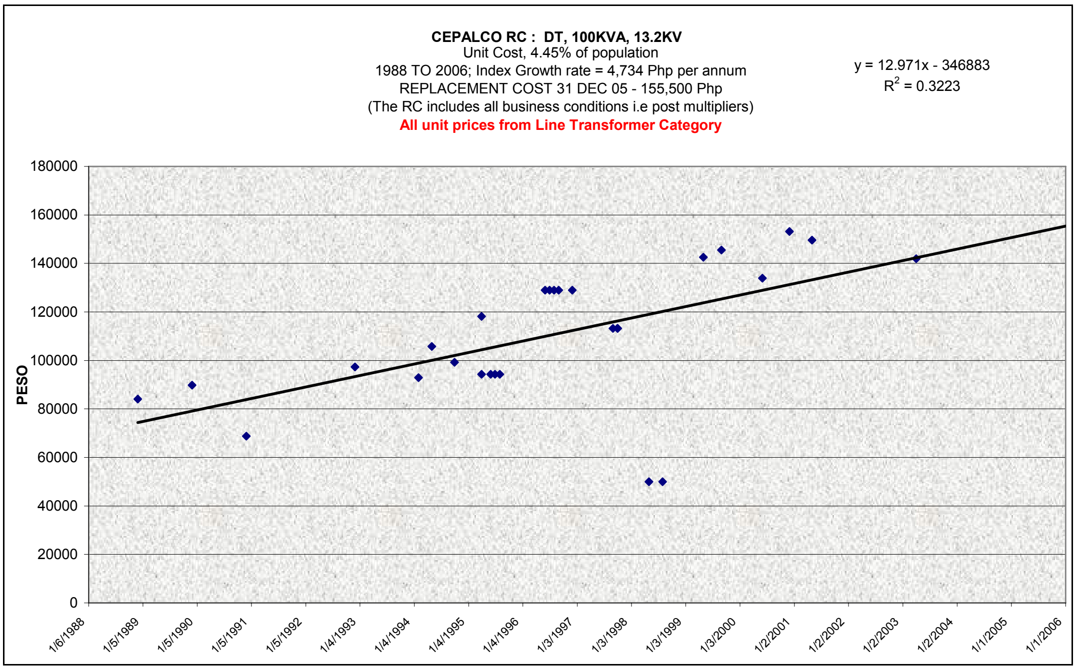


Figure 18: DT – 167kVA, 13.8kV

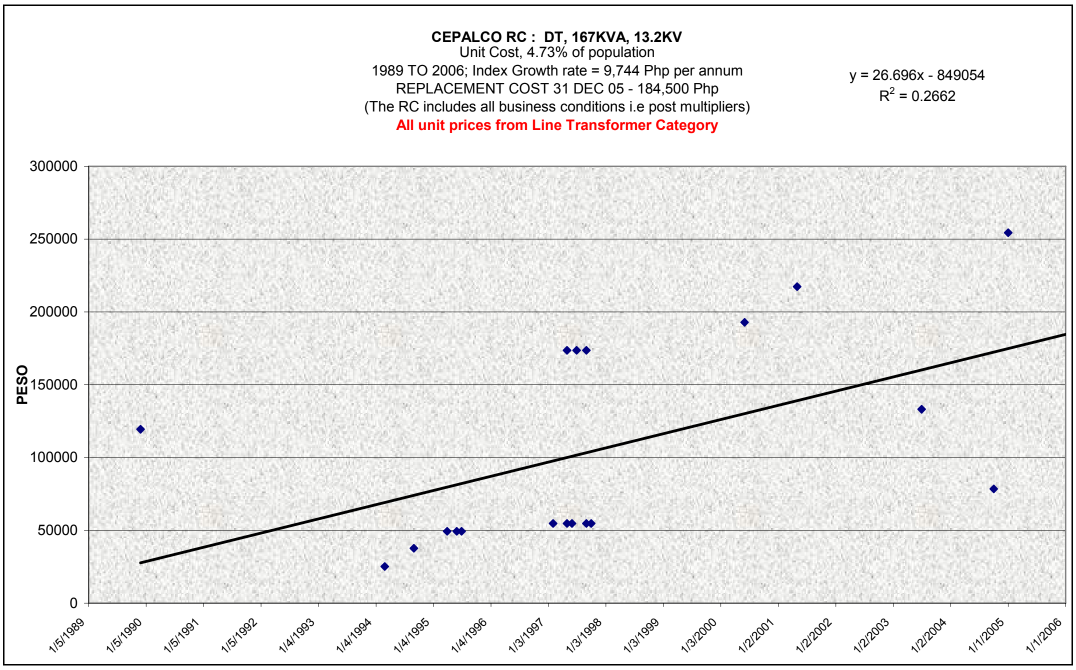


Figure 19: DT – 25kVA, 34.5kV

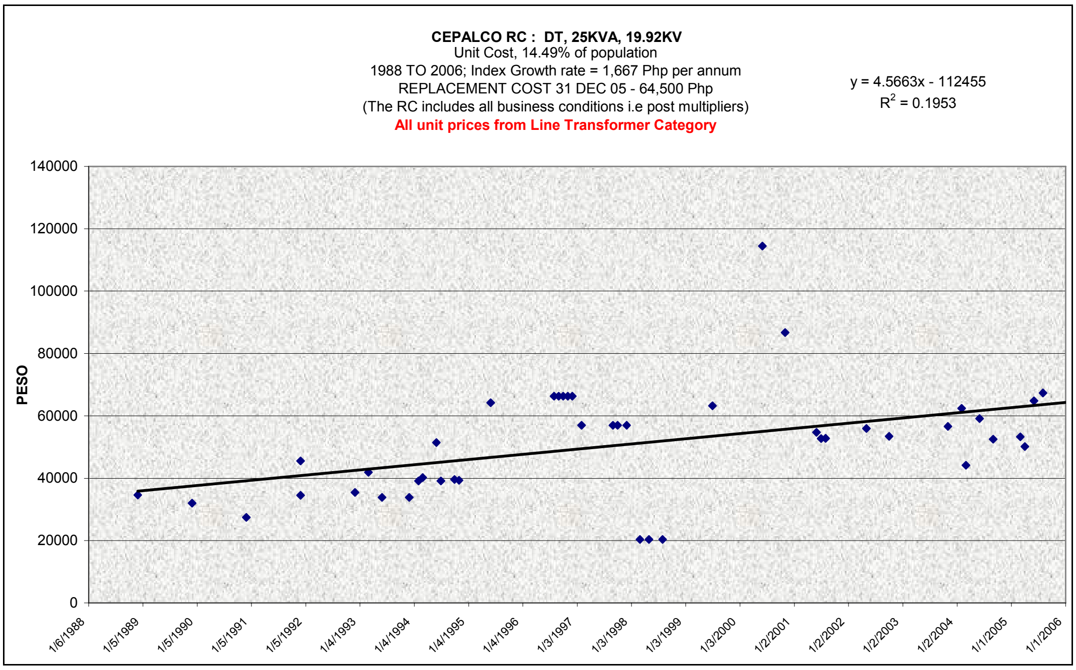


Figure 20: DT – 50kVA, 34.5kV

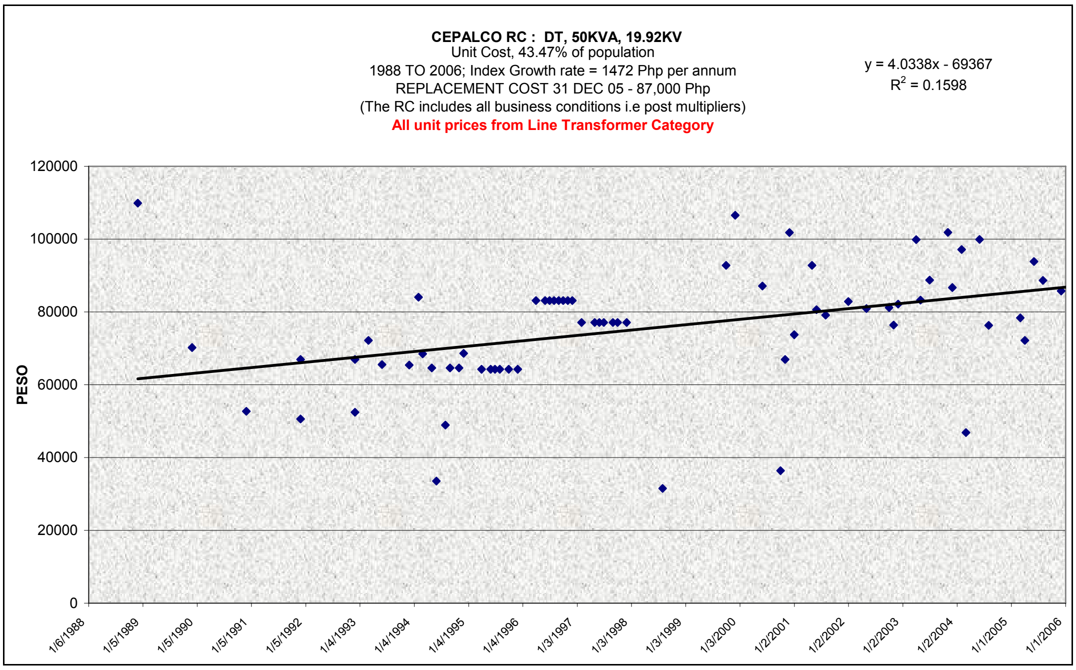
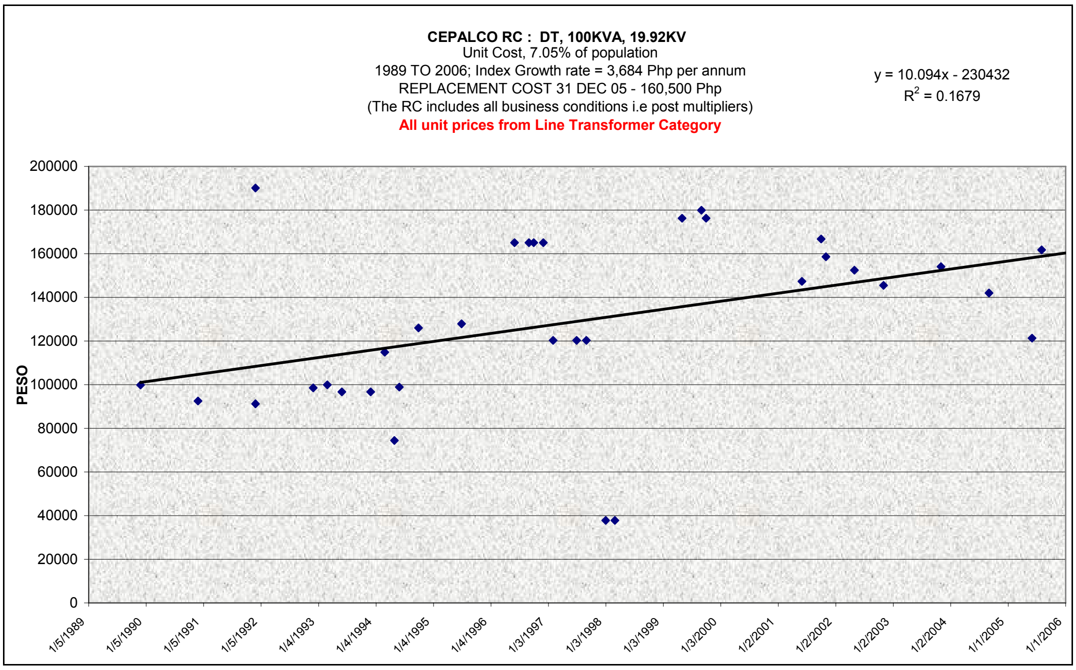


Figure 21: DT – 100kVA, 34.5kV



In summary the charts reveal the following trended replacement costs and replacement cost indexes as at June 2006:

Table 41: RCs for Line Transformers

Standard DT	Replacement Cost at June, 2006 (Php)	RC Growth (Php per annum)
DT, 25KVA, 13.8KV	53,060	4,734
DT, 50KVA, 13.8KV	79,680	2,627
DT, 100KVA, 13.8KV	157,370	4,743
DT, 167KVA, 13.8KV	188,580	9,744
DT, 25KVA, 34.5KV	65,050	1,667
DT, 50KVA, 34.5KV	87,450	1,472
DT, 100KVA, 34.5KV	161,960	3,684

The weighted (by count) average RC index for line transformers < 100kVA is 1377Php per annum, and for the line transformers of 100kVA or greater capacity, the index is 1397Php per annum. PB Associates proposes to adopt a single RC index of 1400Php per annum.

In addition to the standard line transformer sizes, some additional trending was carried out for the following sizes:

Table 42: RCs for Line Transformers

Standard DT	Trended Replacement Cost at Jun 2006 (Php)
DT, 150KVA, 34.5KV	739,663
DT, 15KVA, 34.5KV	64,550
DT, 167KVA, 34.5KV	271,354

These replacements costs are used as in input to the interpolation of the RCs for standard line transformers.

Building Block Verification of Replacement Costs

PB Associates has used a building block model to estimate the replacement cost of line transformers. As discussed in Section 3.3, the material costs have been adjusted to remove the sharp increase in commodity prices of metals since mid-2005. The building block material costs were determined using information from purchase orders dated April 2006.

Building block costs include materials, engineering and labour cost components. An overhead of 5% of raw material cost was applied to the line transformer category. This overhead covers all design and procurement costs.

The labour cost for DTs was based on a 7-man crew + vehicles (daily rate of Php9,000) and the time spent in the following table:

Table 43: Efficient Installation Times for Line Transformers

DT size	Efficient Installation Time
Less than or equal to 50kVA	5 hours
75kVA – 100kVA	6 hours
> 100kVA	12 hours

Table 44: Trended RCs Versus Building Block Costs

<table>
<tr><th>DT Type</th><th>Trended RC at Jun 2006 (Php)</th><th colspan="2">Building Block Cost at Jun 2006 (Php)</th></tr>
<tr><td rowspan="3">DT, 25KVA, 19.92KV</td><td rowspan="3">65,050</td><td>Material</td><td>62,500</td></tr>
<tr><td>Installation Cost</td><td>5,625</td></tr>
<tr><td>TOTAL</td><td>68,125</td></tr>
<tr><td rowspan="3">DT, 50KVA, 19.92KV</td><td rowspan="3">87,450</td><td>Material</td><td>84,340</td></tr>
<tr><td>Installation Cost</td><td>5,625</td></tr>
<tr><td>TOTAL</td><td>89,965</td></tr>
<tr><td rowspan="2">DT, 100KVA, 19.92KV</td><td rowspan="2">161,960</td><td>Material</td><td>156,050</td></tr>
<tr><td>Installation Cost</td><td>6,750</td></tr>
</table>

DT Type	Trended RC at Jun 2006 (Php)	Building Block Cost at Jun 2006 (Php)	
		TOTAL	**162,800**
DT, 25KVA, 13.2KV		Material	50,700
		Installation Cost	5,625
	53,060	TOTAL	**56,325**
DT, 50KVA, 13.2KV		Material	76,090
		Installation Cost	5,625
	79,680	TOTAL	**81,715**
DT, 100KVA, 13.2KV		Material	151,100
		Installation Cost	1,680
	157,370	TOTAL	**157,850**
DT, 167KVA, 13.2KV		Material	180,200
		Installation Cost	13,500
	188,580	TOTAL	**193,700**

Where the trended cost appears to be inaccurate, the building block cost has been adopted. This is because it is likely that there are outlier costs in the asset register. In such instances, further analysis was carried out to check that the building block cost met with the 'interpolated' cost when compared to other conductor sizes.

Summary of Proposed Valuation Approach

PB Associates propose to value line transformers using current replacement cost method.

PB Associates propose to value SVTs using historical cost indexation by applying weighted average RC indexes to SVTs falling into the abovementioned range of capacities.

Table 45: RCs & Indexes for DTs and SVTs

Line Transformers	RC at Jun 2006 (Php)	Indexation (Php per annum)
DTs		
DT, 50KVA, 2.4KV	-	1400
DT, 15KVA, 13.8KV	-	1400
DT, 25KVA, 13.8KV	53,060	-
DT, 50KVA, 13.8KV	79,680	-
DT, 100KVA, 13.8KV	157,370	-
DT, 167KVA, 13.8KV	188,580	-
DT, 15KVA, 34.5KV	58,000	-
DT, 25KVA, 34.5KV	65,050	-

Line Transformers	RC at Jun 2006 (Php)	Indexation (Php per annum)
DT, 37.5KVA, 34.5KV	76,250	-
DT, 50KVA, 34.5KV	87,450	-
DT, 75KVA, 34.5KV	118,700	-
DT, 100KVA, 34.5KV	161,960	-
DT, 150KVA, 34.5KV	164,100	-
DT, 167KVA, 34.5KV	196,480	-
SVTs		
DT, 50KVA; 2.4KV-240/120V; 1PH	-	1400
DT, 25KVA; 13.8KV-240/480V; 1PH	-	1400
DT, 25KVA; 7.62KV-138.5/277V; 1PH	-	1400
DT, 50KVA; 7.62KV-138.5/277V; 1P H	-	1400
DT, 100KVA; 7.62KV-138.5/277V; 1PH	-	1400
DT, 15KVA; 13.8KV-240/120V; 1PH	-	1400
DT, 25KVA; 13.8KV-240/120V; 1PH	-	1400
DT, 50KVA; 13.8KV-240/120V; 1PH	-	1400
DT, 50KVA; 13.8KV-240/480V; 1PH	-	1400
DT, 100KVA; 13.8KV-240/120V; 1PH	-	1400
DT, 100KVA; 13.8KV-240/120V; 1PH	-	1400
DT, 167KVA; 13.8KV-240/120V; 1PH	-	1400
DT, 167KVA; 34.5KV-240/480V; 1PH	-	1400
DT, 15KVA; 34.5KV-240/120V; 1PH	-	1400
DT, 25KVA; 34.5KV-240/120V; 1PH	-	1400
DT, 37.5KVA; 34.5KV-240/120V; 1PH	-	1400
DT, 50KVA; 34.5KV-240/120V; 1PH	-	1400
DT, 50KVA; 34.5KV-138.5/277V	-	1400
DT, 50KVA; 13.8KV-240/480V; 1PH	-	1400
DT, 50KVA; 34.5KV-120/240X138.5/277V	-	1400
DT, 75KVA; 34.5KV-240/120V; 1PH	-	1400
DT, 100KVA; 34.5KV-240/120V; 1PH	-	1400
DT, 100KVA; 34.5KV-138.5/277V; 1PH	-	1400
DT, 100KVA; 34.5KV-240/480V; 1PH	-	1400
DT, 100KVA; 34.5KV-120/240X138.5/277V	-	1400
DT, 150KVA; 34.5KV-240/480V; 1PH	-	1400
DT, 150KVA; 34.5KV-138.5/277V; 1PH	-	1400
DT, 167KVA; 34.5KV-138.5/277V; 1PH	-	1400
DT, 167KVA; 34.5KV-120/240X138.5/277V	-	1400
DT, 167KVA; 34.5KV- 120/240X138.5/277V	-	1400

A14 – POWER CONDITIONING EQUIPMENT

Cepalco has no substation capacitors, line capacitors or voltage regulators in use.

A15 – SERVICES

Cepalco has 2,954 kilometres of 220V low voltage conductors used for LV services and streetlights. As previously analysed under A06 – Overhead Conductors and Devices, the most common service conductor is the AAC, #8 AWG, Solid conductor. This conductor is used in approximately 90% of cases.

Table 46: Assets In Use

Cepalco Classification	Standard Wire Description	Sq mm
2-023-101	WIRE, AAC, #10 AWG, SOLID	5
2-023-102	WIRE, AAC, #8 AWG, SOLID	8.5
2-023-103	AAC NO. 6 AWG SOLID	13.3
2-023-104	AAC NO. 4 AWG SOLID	21.5
2-023-111	AAC NO.6 AWG STRANDED	13.3
2-023-113	WIRE, AAC, #2 AWG, STRANDED	33.5
2-023-114	AAC NO. 1/10 STRANDED, INSULATED	54
2-023-202	WIRE, ACSR, #4 AWG, WP	21.5
2-023-203	WIRE, ACSR, #2 AWG, WP	33.5
2-023-204	WIRE, ACSR, #1/0 AWG, WP	54
2-023-207	WIRE, ACSR, #4/0 AWG, WP	106
2-023-301	WIRE, ACSR, #4 AWG, BARE	21.5
2-023-302	WIRE, ACSR, #2 AWG, BARE	33.5
2-023-303	WIRE, ACSR, #1/0 AWG, BARE	54
2-023-308	WIRE, ACSR, #477MCM AWG, BARE	240
2-024-103	WIRE, CU, #6 AWG, SOLID, WP	13.3
2-024-203	WIRE, CU, #10 AWG SOLID TW	5
2-024-204	WIRE, CU, # 8 AWG SOLID, TW	8.5
2-024-211	WIRE, CU, #14 AWG, STRANDED, TW	
2-024-212	WIRE, CU, #12 AWG 7-STR, TW	3.3
2-024-213	WIRE, CU, #10 AWG, STRANDED, THHN, PHELP DODGE	5
2-024-214	WIRE, CU, # 8 AWG SOLID WP	8.5
2-024-215	WIRE, CU, #6 AWG, STRANDED, TW	13.3
2-024-216	WIRE, CU, #4 AWG, STRANDED, TW	21.5
2-024-217	WIRE, CU, #2 AWG, STRANDED, TW	33.5
2-024-218	WIRE, CU, #1/0 AWG, STRANDED, TW	54
2-024-219	WIRE, CU, #2/0 AWG, STRANDED, TW	67
2-024-221	WIRE, CU, #4/0 AWG, STRANDED, TW	106
2-024-222	WIRE, CU, #250 MCM AWG, STRANDED, TW	126
2-024-224	WIRE, CU, #500 MCM AWG, STRANDED, TW	240
2-024-225	WIRE, CU, #750 MCM AWG, STRANDED, TW	400
2-024-402	WIRE, CU, #2 AWG, SD, BARE	33.5

Many of these conductors have a relatively small amount in use. The common assets by count are as follows:

Table 47: Common Services by Count

Services	Count (km)	% by Count	% by Value
WIRE, AAC, #8 AWG, SOLID	2,030	5.76%	1.33%
WIRE, ACSR, #4 AWG, WP	298	6.09%	4.50%
WIRE, ACSR, #2 AWG, WP	1,248	25.50%	10.23%
WIRE, ACSR, #1/0 AWG, WP	688	14.06%	13.26%

Figure 22: Wire, AAC, #8 AWG, SOLID

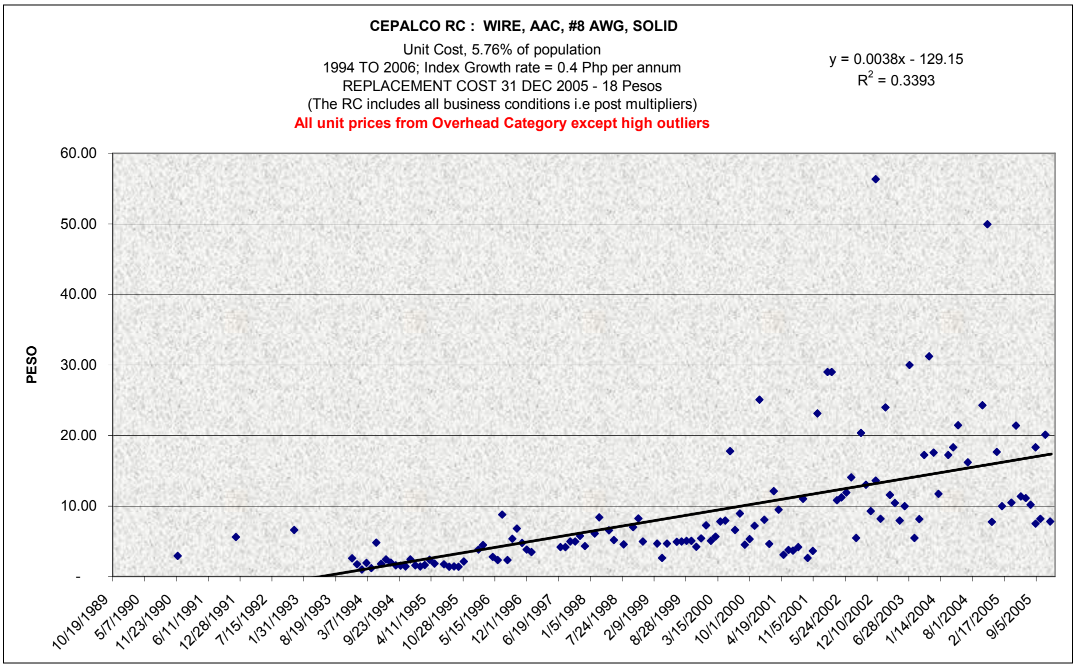


Figure 23: Wire, ACSR, #4 AWG, WP

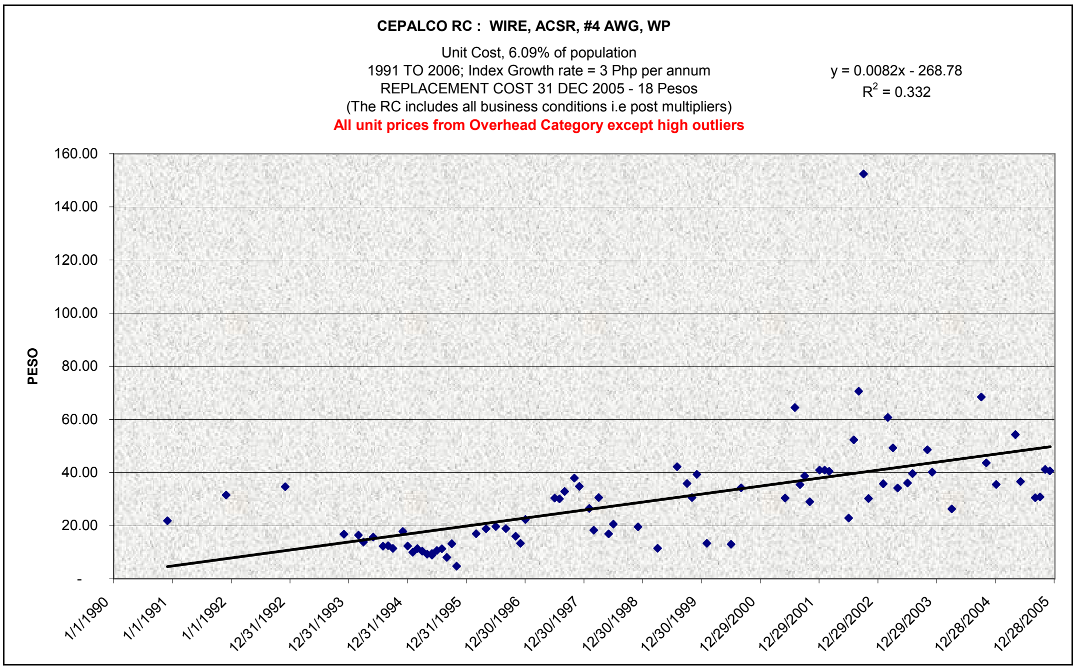


Figure 24: Wire, ACSR, #2 AWG, WP

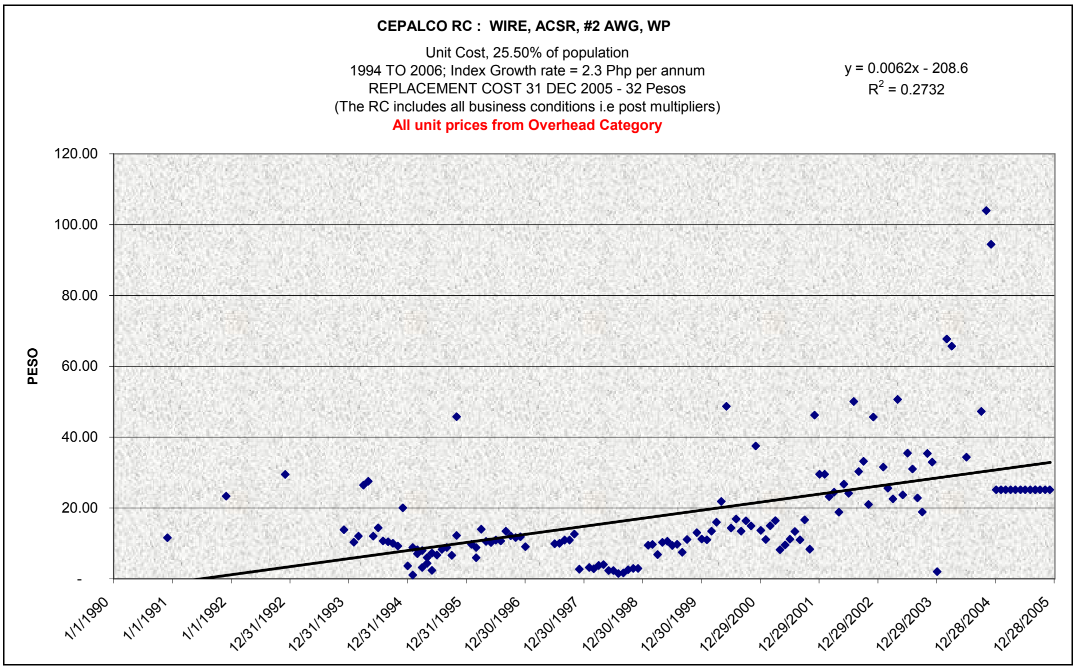
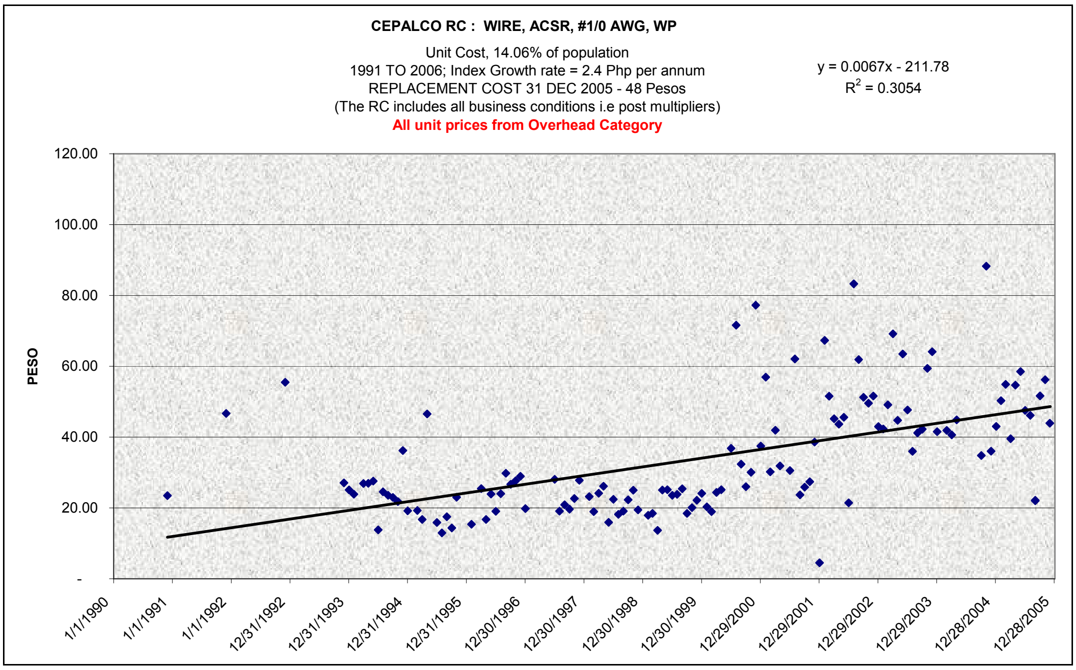


Figure 25: Wire, ACSR, #1/0 AWG, WP



The following Table provides a summary of the trended historical costs and indexes for each of the common service sizes.

Table 48: Trended RC for Services

DWRG Category	Standard Line Conductor	Trended RC to Jun 2006 (Php)	Indexation (Php per annum)
A15	WIRE, AAC, #8 AWG, SOLID	9	0.44
A15	WIRE, ACSR, #4 AWG, WP	15	3.0
A15	WIRE, ACSR, #2 AWG, WP	34	2.3
A15	WIRE, ACSR, #1/0 AWG, WP	50	2.4

The indexes provide a reference for scaling off other conductor indexes according to conductor size.

Building Block Verification of Replacement Costs

PB Associates has used a building block model to estimate the replacement cost of services. As discussed in Section 3.3, the material costs have been adjusted to remove the sharp increase in commodity prices of metals since mid-2005.

The average service length is 30 meters. An efficient crew would install 15services per day (equivalent to one-third of DT capacity) or 450 meters per hour. Labour cost is based on a 5-man crew + vehicles at a total rate of Php6,140 per day. The average replacement cost per meter would be Php14.

Table 49: Trended RCs Versus Building Block Costs

Conductor Type	Trended RC at June 01, 2006 (Php/m)	Building Block Cost at June 01, 2006 (Php/m)	
WIRE, AAC, #8 AWG, SOLID		Material	9
		Installation Cost	14
	9	TOTAL	**23**
WIRE, ACSR, #4 AWG, WP		Raw Material	29
		Installation Cost	14
	15	TOTAL	**43**
WIRE, ACSR, #2 AWG, WP		Material	38
		Installation Cost	14
	34	TOTAL	**52**
WIRE, ACSR, #1/0 AWG, WP		Material	58
		Installation Cost	14
	50	TOTAL	**72**

Summary of Proposed Valuation Approach

The following replacement costs and indexes were assigned to low voltage services based on the building block costs and interpolation of costs for intermediate values as per Table 48. The indexes are determined in accordance with Table 32 in Section A6 & A7.

Table 50: RCs / Indexes for Services

Cepalco Classification	Standard Conductor	RC Jun 06 (Php)	Scaled Index (Php per annum))
2-023-101	WIRE, AAC, #10 AWG, SOLID		1.4
2-023-102	WIRE, AAC, #8 AWG, SOLID	20	
2-023-103	AAC NO. 6 AWG SOLID		
2-023-104	AAC NO. 4 AWG SOLID		
2-023-111	AAC NO.6 AWG STRANDED		
2-023-113	WIRE, AAC, #2 AWG, STRANDED		1.4
2-023-114	AAC NO. 1/10 STRANDED, INSULATED		
2-023-202	WIRE, ACSR, #4 AWG, WP	40	
2-023-203	WIRE, ACSR, #2 AWG, WP	55	
2-023-204	WIRE, ACSR, #1/0 AWG, WP	86	
2-023-207	WIRE, ACSR, #4/0 AWG, WP		5.0
2-023-301	WIRE, ACSR, #4 AWG, BARE		
2-023-302	WIRE, ACSR, #2 AWG, BARE		
2-023-303	WIRE, ACSR, #1/0 AWG, BARE		
2-023-308	WIRE, ACSR, #477MCM AWG, BARE		
2-024-103	WIRE, CU, #6 AWG, SOLID, WP		22
2-024-203	WIRE, CU, #10 AWG SOLID TW		

2-024-204	WIRE, CU, # 8 AWG SOLID, TW		
2-024-211	WIRE, CU, #14 AWG, STRANDED, TW		
2-024-212	WIRE, CU, #12 AWG 7-STR, TW		
2-024-213	WIRE, CU, #10 AWG, STRANDED, THHN, PHELP DODGE		22
2-024-214	WIRE, CU, # 8 AWG SOLID WP		22
2-024-215	WIRE, CU, #6 AWG, STRANDED, TW		
2-024-216	WIRE, CU, #4 AWG, STRANDED, TW		
2-024-217	WIRE, CU, #2 AWG, STRANDED, TW		22
2-024-218	WIRE, CU, #1/0 AWG, STRANDED, TW		22
2-024-219	WIRE, CU, #2/0 AWG, STRANDED, TW		
2-024-221	WIRE, CU, #4/0 AWG, STRANDED, TW		22
2-024-222	WIRE, CU, #250 MCM AWG, STRANDED, TW		
2-024-224	WIRE, CU, #500 MCM AWG, STRANDED, TW		
2-024-225	WIRE, CU, #750 MCM AWG, STRANDED, TW		
2-024-402	WIRE, CU, #2 AWG, SD, BARE		

A16 & A17 – METERS, INSTRUMENTS & METERING TRANSFORMERS

Cepalco has 96,380 metering assets.

Table 51: Metering Class IDs by Cepalco Classification

Metering Class ID	Description	Reported Count
Schedule 16	Street Lighting	46
Schedule 26	Residential	79,670
Schedule 36	General Service – Small	14,449
Schedule 46	General Service – Large	1,867
Schedule 56	General Power – Small	334
Schedule 66	General Power – Large	1
Schedule 76	Bulk Power	11
Schedule 86	Bulk High Voltage	1
Schedule 96	Bulk HV Wheeling	1
Total		**96,380**

These metering assets have been mapped to standard meter classes as follows:

Table 52: Metering Class IDs by ODRC Classification

Metering Class ID	ODRC Meter Description	Metering Asset Count
16 or 26	1 phase, 15A or Class 100	123,191
36	1 phase, 30A or Class 200	1,139
46	3 phase, 15/30A, Class 100/200	5,722
56 to 96	3 phase, 2.5A, instrument rated	1,300

After allocation, PB Associates trended the historical costs for these classes of metering equipment.

The historical costs were drawn from Cepalco verified ODRC asset register.

Figure 26: Class 36 Meters

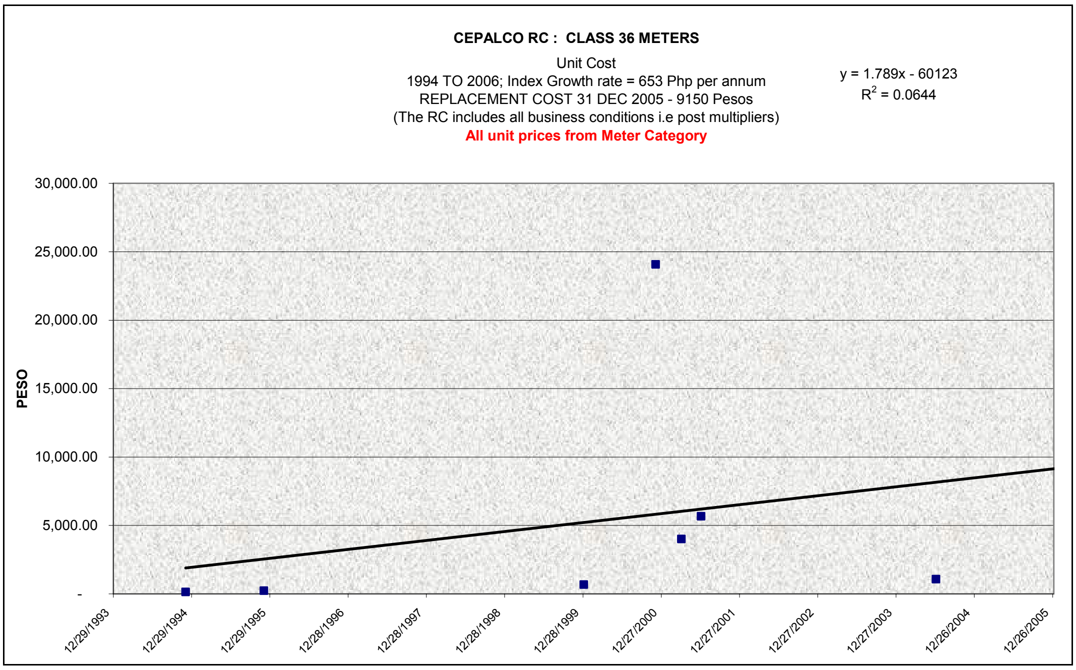


Figure 27: Class 46 Meters

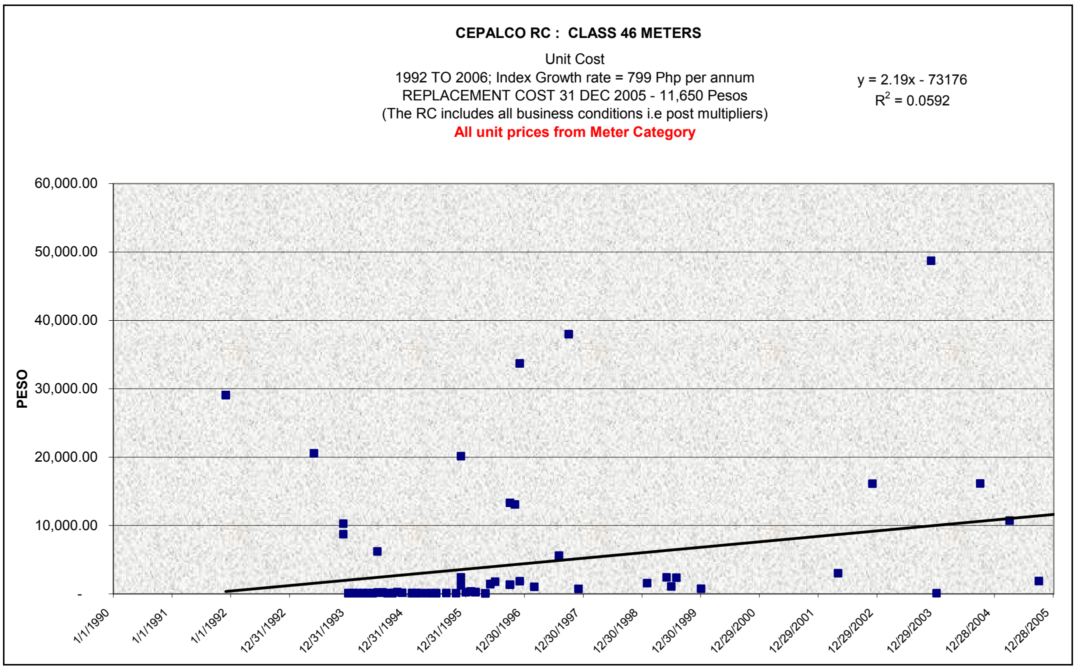


Figure 28: Class 16 or 26 Meters (no outliers)

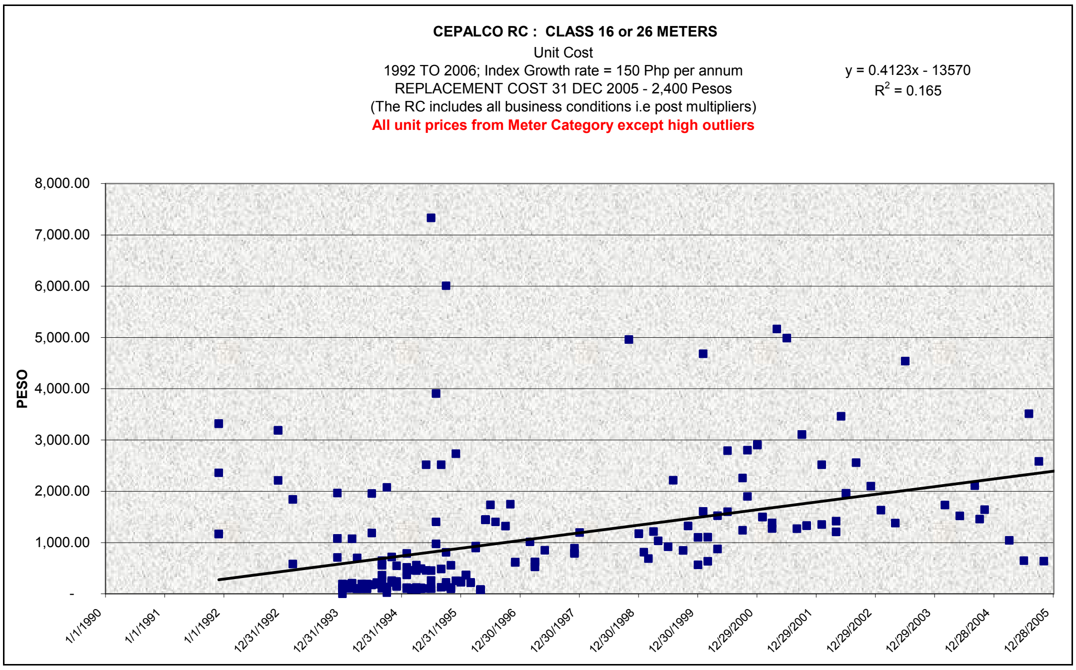
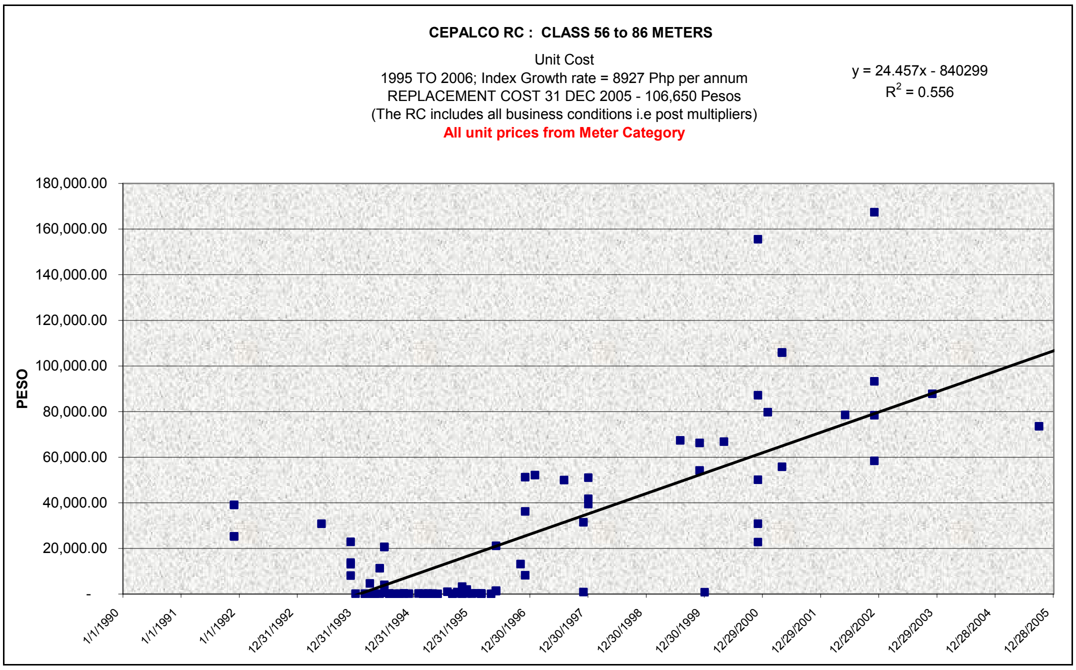


Figure 29: Class 56 to 86 Meters



In summary the charts reveal the following trended replacement costs and annual replacement cost growth indexes as at June 2006:

Table 53: Trended RCs for Standard Meter Classes

Standard Meter Class	Trended Replacement Cost at June, 2006 (Php)	Indexation (Php per annum)
36	4,202	653
46	8,434	799
16 or 26	1,315	--
16 or 26 (w/o outliers)	1,587	150
56 to 86	98,248	8,927

Summary of Proposed Valuation Approach

PB Associates propose to value meters using current replacement cost method. The analysis in the preceding section suggests the following RCs for Cepalco meters: PB Associates considers that efficient manhours, appropriate materials and labour cost for the replacement of meters are as follows:

Table 54: PB Associates Building Block Costs

Metering	Efficient Installation Time	Materials	Labour	Total Cost
Single-Phase, Plain Residential Metering	3 hours	2,000	390	2,390
Single-Phase, Small Commercial Metering (1 ph, 30A or Cl200)	4 hours	8,630	520	9,150
Low Voltage Self-Contained Metering (3 ph, 30A, Cl100/200)	12.5 hours	9,995	1,625	11,620
Low Voltage Self-Contained Metering (3 ph, 2.5A Instrument Rated)	15 hours	104,680	1,950	106,630

Table 55: RCs for Meters

Standard Meter Class	Meters	RC for Jun 06 (Php)
36	Single-Phase, Plain Residential Metering (1 ph, 15A or Cl100)	2,390
16 or 26	Single-Phase, Small Commercial Metering (1 ph, 30A or Cl200)	9,150
56 to 86	Low Voltage Self-Contained Metering (3 ph, 2.5A Instrument Rated)	106,630
46	Low Voltage Self-Contained Metering (3 ph, 30A, Cl100/200)	11,620

A18 – INFORMATION TECHNOLOGY

Cepalco has no information technology dedicated for distribution purpose.

A19 – REGULATED ENTITY PROPERTY ON CONSUMER PREMISES

Cepalco has no regulated entity property on consumer premises in use.

A20 – STREET LIGHTS & SIGNAL SYSTEMS

Cepalco owns only 16 luminaires. The majority of street lights are customer-owned, and only photo switches and control boxes are owned by Cepalco. Given that the assets are not fully functioning luminaries (with and without mast arm and pole) as well as the low value of this asset category, street lights have been valued using indexed historical costs.

An index of 5.2% Php per annum has been applied to this category. This index is based on analysis performed by PB Associates for streetlights (luminaires) in use elsewhere in the Philippines, notably on Luzon.

A21 – SUBMARINE CABLES

Cepalco does not own submarine cables at the time of this valuation.

APPENDIX A
SUMMARY - STANDARD REPLACEMENT COSTS

Standard Replacement Costs / Indexes and Standard Lives

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Cepalco Standard RC or Index (Php k or Php per annum)
A1	**LAND & LAND RIGHTS (DISTRIBUTION PURPOSE)**		
	To be valued using market comparison as highlighted in Section 5 of these Guidelines		
A2	**STRUCTURES & IMPROVEMENTS (DISTRIBUTION PURPOSE)**		
	To be valued using indexed historical costs as explained in Section 5 of these Guidelines		
A3	**STATION EQUIPMENT**		
A3A	**POWER TRANSFORMERS**		
	Refer to Table 3 below		
A3B	**SWITCHGEAR**		
A3B	**Circuit Breakers**		
A3B	SF_6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1200 A, 40 kA	no.	3,400,704
A3B	SF_6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 1600 A, 40 kA	no.	3,808,080
A3B	SF_6 Dead Tank Circuit Breaker, 69 kV Outdoor, 3-pole, 2000 A, 31.5 kA	no.	4,162,320
A3B	SF_6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 25 kA	no.	2,615,472
A3B	SF_6 Dead Tank Circuit Breaker, 34.5 kV Outdoor, 1200 A, 31.5 kA	no.	3,778,560
A3B	SF_6 Dead Tank Circuit Breaker, 13.8 kV Outdoor, 1200 A, 25 kA	no.	2,460,000
A3B	Metalclad Switchgear 13.8 kV, 7 Vacuum Circuit Breakers, Indoor, 1200A	no.	800,000
A3B	***Disconnectors***		
A3B	Disconnector, 115 kV, 1200 A, ground mounted with support structure	no.	823,680
A3B	Disconnector, 69 kV, 1200 A, ground mounted with support structure	no.	503,712
A3B	Disconnector, 34.5 kV, 200 A, mounted on bus structure supports	no.	228,800
A3B	Disconnector, 34.5 kV, 400 A, mounted on bus structure supports	no.	275,734
A3B	Disconnector, 34.5 kV, 600 A, mounted on bus structure supports	no.	322,666
A3B	Disconnector, 34.5 kV, 1200 A, mounted on bus structure supports	no.	475,200
A3B	Disconnector, 13.8 kV, 400 A, mounted on bus structure supports	no.	158,400
A3B	Disconnector, 13.8 kV, 600 A, mounted on bus structure supports	no.	211,200
A3C	**PROTECTIVE EQUIPMENT**		
A3C	***Potential Transformers***		

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Cepalco Standard RC or Index (Php k or Php per annum)
A3C	Potential Transformers, 69 kV, Outdoor, 600/350:1	no.	295,680
A3C	Potential Transformers, 34.5 kV, Outdoor, 350/175: 1	no.	191,140
A3C	Potential Transformers, 13.8 kV, Outdoor, 120/70:1	no.	191,140
A3C	***Lightning Arresters***		
A3C	Lightning Arrester, 60 kV, Station Class (69 kV system voltage)	no.	100,000
A3C	Lightning Arrester, 28 kV, Distribution Class (34.5 kV system voltage)	no.	6,300
A3C	Lightning Arrester, 15 kV, Distribution Class (13.8 kV system voltage)	no.	3,675
A3C	Lightning Arrester, 6 kV, Distribution Class (6.24 kV system voltage)	no.	2,310
A3C	***Protection Schemes/Relays***		
A3C	230/115/69 kV Transformer Differential Protection Scheme (1 panel per transformer)	no.	814,000
A3C	34.5 kV (and below) Transformer Differential Protection Scheme (2 transformer per panel)	no.	1,118,895
A3C	34.5 kV (and below) Feeder Protection (3 feeders per protection panel)		775,000
A3C	Over & Under Frequency Relays / Per Unit Cost	no.	500,000
A3E	**COMMUNICATIONS EQUIPMENT**		
A3E	***SCADA & Other Comm's Eqpt***		
	Valuation to be based on indexed historical costs		
A3F	**OTHER STATION ITEMS**		
A3F	***Substation Structures***		
	Refer to Table 2		
A4	**TOWERS, POLES & FIXTURES (DISTRIBUTION)**		
A4	***Wood Poles***		
A4	Pole, Wood; 7.5 M (25 FT)	no.	9,340
A4	Pole, Wood; 9.0 M (30 FT)	no.	13,200
A4	Pole, Wood; 10.5 M (35 FT)	no.	15,100
A4	Pole, Wood; 12.0 M (40 FT)	no.	17,770
A4	Pole, Wood; 13.5 M (45 FT)	no.	28,670
A4	Pole, Wood; 15.0 M (50 FT)	no.	41,200
A4	Pole, Wood; 16.5 M (55 FT)	no.	44,900
A4	Pole, Wood; 18.0 M (60 FT)	no.	59,000
A4	Pole, Wood; 19.5 M (65 FT)	no.	82,000
A4	Pole, Wood; 21.0 M (70 FT)	no.	102,600
A4	Pole, Wood; 22.5 M (75 FT)	no.	117,900
A4	Pole, Wood; 24.0 M (80 FT)	no.	131,700

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Cepalco Standard RC or Index (Php k or Php per annum)
A4	***Concrete Poles***		
A4	Pole, Concrete, 7.5 M (25 FT)	no.	9,340
A4	Pole, Concrete, 9.0 M (30 FT)	no.	13,200
A4	Pole, Concrete, 9.5 M (32 FT)	no.	13,200
A4	Pole, Concrete, 10.5 M (35 FT)	no.	15,100
A4	Pole, Concrete, 12.0 M (40 FT)	no.	17,770
A4	Pole, Concrete, 13.5 M (45 FT)	no.	28,670
A4	Pole, Concrete, 15.0 M (50 FT	no.	41,200
A4	Pole, Concrete, 16.5 M (55 FT)	no.	44,900
A4	Pole, Concrete, 23M (75 FT) I	no.	117,900
A4	***Pole Top Hardware***		
A4	138 kV Pole Top Hardware - 3 phase	no.	86,100
A4	69 kV Pole Top Hardware - 3 phase	no	92,000
A4	34.5 kV Pole Top Hardware - 3 phase	no	11,400
A4	34.5 kV Pole Top Hardware - 2 phase	no	3,600
A4	13.8 kV Pole Top Hardware - 3 phase	no	6,400
A4	13.8 kV Pole Top Hardware - 2 phase	no	1,800
A4	220 V Pole Top Hardware - 3 phase	no	837
A4	220 V Pole Top Hardware - 2 phase	no	780
A6	**OVERHEAD CONDUCTORS & DEVICES (DISTRIBUTION)**		
A6	***Overhead Conductors***		
A6	795 MCM Bare ACSR Conductor	m	496
A6	477 MCM Bare ACSR Conductor	m	352
A6	336.4 MCM Bare ACSR Conductor	m	214
A6	#1/0 AWG Bare ACSR Conductor	m	87
A6	#2 AWG Bare ACSR Conductor	m	65
A6	#8 AWG, Bare AAC, Conductor MULTI	m	15
A6	Tree Wire, #1/0 AWG COPPER MULTI	m	324
A6	Wire, Spinning; CU; SOLID; AWG NO 1 MULTI	m	49
A6	***Overhead Distribution Devices***		
A6	***Fuses***		
A6	Power Fuse, 100 E AMP; 34.5KV	no.	10,000
A6	***Switches***		
A6	***Circuit Reclosers***		
A6	Circuit Recloser, 34.5kV, 140AMP, 3-Phase	no.	575,000
A6	Circuit Recloser, 34.5kV, 25AMP, 3-Phase	no.	365,000
A6	Circuit Recloser, 13.8KV; 400AMP; 3-Phase	no.	700,000
A6	Circuit Recloser, 13.8KV; 200AMP; 3-Phase	no.	440,000
A6	Circuit Recloser, 13.8 KV; 70AMP, 3-Phase	no.	280,000
A12	**LINE TRANSFORMERS (DISTRIBUTION)**		
A12	DT, 15KVA; 34.5KV-240/120V; 1PH; Pole Mounted HC	no.	58,000
A12	DT, 25KVA; 34.5KV-240/120V; 1PH; Pole Mounted	no.	65,050

DWRG Cat'y	Asset Category/Sub-Category/Type	Unit	Cepalco Standard RC or Index (Php k or Php per annum)
A12	DT, 37.5KVA; 34.5KV-240/120V; 1PH; Pole Mounted	no.	76,250
A12	DT, 50KVA; 34.5KV-240/120V; 1PH; Pole Mounted	no.	87,450
A12	DT, 75KVA; 34.5KV-240/120V; 1PH;Pole Mounted	no.	118,700
A12	DT, 100KVA; 34.5KV-240/120V; 1PH; Pole Mounted	no.	161,960
A12	DT, 150KVA; 34.5KV-240/120V; 1PH; Pole Mounted		164,100
A12	DT, 167KVA; 34.5KV-240/120V; 1PH; Pole Mounted	no.	196,480
A12	DT, 25KVA; 13.8KV-240/120V; 1PH; Pole Mounted	no.	53,060
A12	DT, 37.5KVA; 13.8KV-240/120V; 1PH; Pole Mounted	no.	66,350
A12	DT, 50KVA; 13.8KV-240/120V; 1PH; Pole Mounted	no.	79,680
A12	DT, 75KVA; 13.8KV-240/120V; 1PH; Pole Mounted	no.	118,525
A12	DT, 100KVA; 13.8KV-240/120V; 1PH; Pole Mounted	no.	157,370
A12	DT, 167KVA; 13.8KV-240/120V; 1PH; Pole Mounted	no.	188,580
A15	**SERVICES**		
A15	Single #8 AWG AAC Cable, 600V	m	20
A15	Wire, ACSR, #1/0 AWG, WP	m	86
A15	Wire, ACSR, #2 AWG, WP	m	55
A15	Wire, ACSR, #4 AWG, WP	m	40
A16	**METERS, INSTRUMENTS & METERING TRANSFORMERS (DISTRIBUTION)**		
A16	Single-Phase, Plain Residential Metering	no.	2,390
A16	Low Voltage Self-Contained Metering	no.	11,620
A16	Low Voltage Self-Contained Metering (Instrument Rated)	no.	106,630
A16	Single-Phase, Commercial Metering	no.	9,150

Standard Asset Values for Power Transformers

Voltage	MVA	Classification	Unit Price Cepalco PhP
69/34.5 kV	33	Off Load Tap Changer	24,003,840
69/34.5 kV	10	Off Load Tap Changer	14,427,840
69/13.8 kV	15/20	Off Load Tap	19,662,720

Voltage	**MVA**	**Classification**	**Unit Price Cepalco PhP**
		Changer	
69/13.8 kV	10	Off Load Tap Changer	14,683,200