

***GEOFF BROWN & ASSOCIATES LTD***

**PERFORMANCE BASED RATE SETTING  
REVIEW OF FORECAST CAPITAL EXPENDITURE FOR THE SECOND  
REGULATORY PERIOD**

**IBAAN ELECTRIC AND ENGINEERING CORPORATION  
(IEEC)**

Prepared for  
**ENERGY REGULATORY COMMISSION**

**FINAL**  
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**EXECUTIVE SUMMARY**

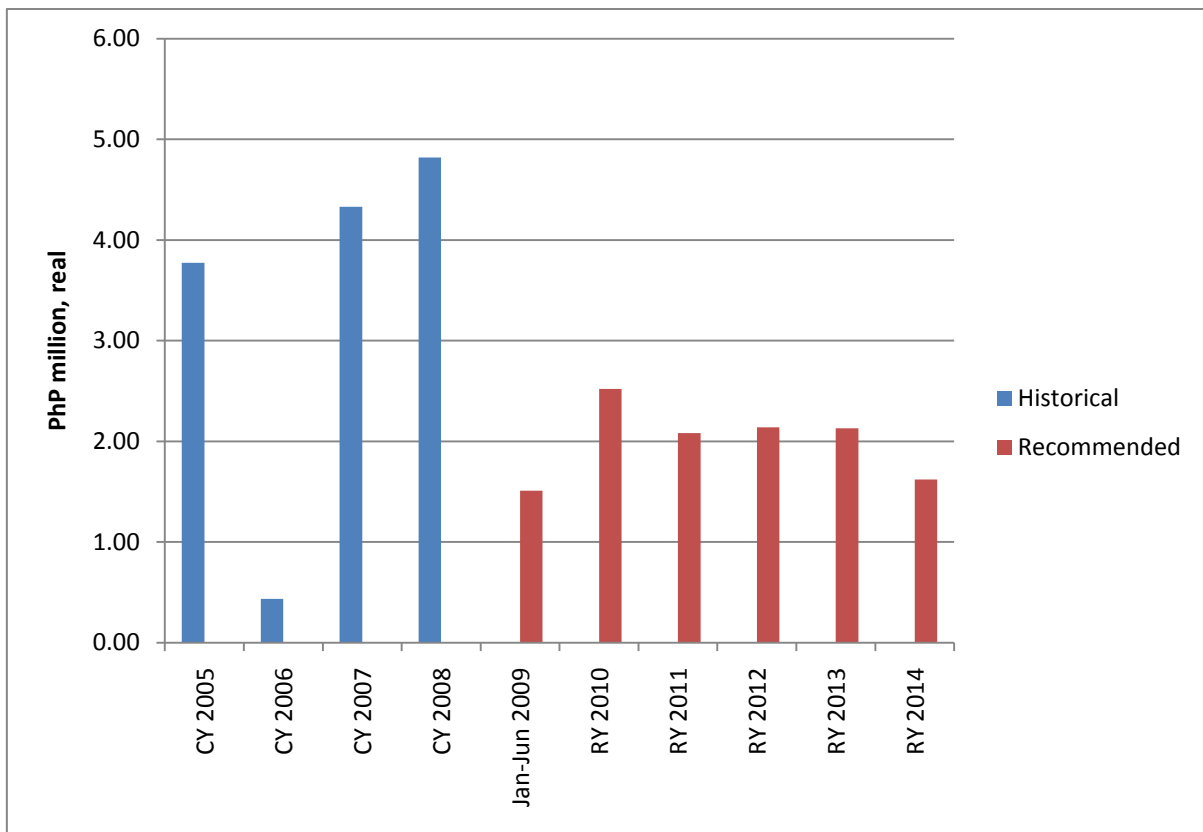
We recommend that IEEC’s CAPEX forecast, submitted as revised after the clarificatory meeting, be accepted without further adjustment. We also recommend that all CAPEX be treated as renewal for operating and maintenance expenditure (OPEX) modeling purposes.

A comparison of the recommended CAPEX with IEEC’s historical CAPEX is shown below.

**Comparison of Historical CAPEX with Recommended Forecast (PhP Million, real)**

	CY 2005	CY 2006	CY 2007	CY 2008	Jan-Jun 2009	RY 2010	RY 2011	RY 2012	RY 2013	RY 2014	Total RY 2010-14
Historical	3.77	0.43	4.33	4.82							
Recommended					1.51	2.61	2.08	2.14	2.13	1.62	7.97

**Comparison of Historical CAPEX with Recommended Forecast (PhP Million, real)**



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## 1. INTRODUCTION

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The Energy Regulatory Commission (ERC) is currently implementing a performance-based form of regulation (PBR) for investor owned electricity distribution utilities in the Philippines. Under the PBR framework a distribution utility will be subject to a cap on the average price that it may charge for the delivery of distribution wheeling services. This price cap is reset in advance of each four (4) year regulatory period using the building block approach described in the Rules for Setting the Distribution Wheeling Rate (RDWR), which was released by the ERC on December 8 2008<sup>1</sup>. It takes the form of a price path that specifies the maximum average price (MAP) that a regulated utility may charge in each year of the regulatory period.

The entry of distribution utilities into the PBR process has been staggered into four (4) entry points and the reset process for the setting of the price cap for the six (6) utilities entering the PBR at the third entry point is currently underway. This process will result in the setting of the price path for each utility for a regulatory period that commences on July 1 2010 and terminates on June 30 2014. This regulatory period is specified in the RDWR as the second regulatory period<sup>2</sup>.

The ERC has published a Position Paper, also dated December 8 2008, which sets out in some detail how the price reset process for the six (6) third entry point utilities will be undertaken<sup>3</sup>.

An important requirement of this reset process is the review of the capital expenditure (CAPEX) forecasts submitted by the utilities in their revenue applications that have been submitted in accordance with the requirements of the RDWR and the Position Paper. CAPEX over the second regulatory period will impact the size of the regulated asset base (RAB), which will in turn impact both the return on capital (profit) and return of capital (depreciation). Profit and depreciation form two of the building blocks in the price setting process specified in the RDWR.

Geoff Brown & Associates Ltd (GBA) has been engaged by the ERC to review the capital expenditure forecasts of the utilities that will enter PBR at the third entry point. These are:

- Cabanatuan Electric Corporation (CELCOR);
- Davao Light and Power Company (DLPC);
- Ibaan Electric and Engineering Corporation (IEEC);
- La Union Electric Company (LUECO);
- Tarlac Electric Incorporated (TEI); and
- Visayan Electric Company (VECO).

In accordance with clause 4.12.4 of the RDWR the objective of the review is to determine whether each CAPEX forecast is:

- based upon the best available prices obtainable from international markets;
- reasonably efficient from a design and implementation point of view;

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<sup>1</sup> Rules for Setting Distribution Wheeling Rates for Privately Owned Distribution Utilities Entering Performance Based Regulation (Third Entry Point), Energy Regulatory Commission, December 8 2008.

<sup>2</sup> No first regulatory period applied to the six utilities entering PBR at the third entry point.

<sup>3</sup> Regulatory Reset for the July 2010 to June 2014 Regulatory Period for Privately Owned Distribution Utilities subject to Performance Based Regulation, Position Paper, Energy Regulatory Commission, 8 December 2008.

- likely to support the forecast growth in connections, co-incident peak demand and energy delivered; and
- sufficient to allow the relevant utility to achieve or exceed the applicable target levels of performance.

This report presents GBA's review of the capital expenditure forecast of IEEC. The forecast was submitted to the ERC as part of IEEC's revenue and performance incentive scheme application (revenue application) in June 2009.

In undertaking this review we have relied on the accuracy of the information provided to the ERC by IEEC. During the clarificatory meeting process, we queried information that appeared to be incomplete, inconsistent or inaccurate. However, we did not undertake an audit or attempt to verify the information on which we relied. We therefore cannot be held responsible for any conclusions or recommendations based on misleading or inaccurate information provided to us.

**2. NETWORK OVERVIEW**

**2.1 NETWORK DESCRIPTION**

IEEC takes supply from a single circuit 69 kV line owned by the National Grid Corporation of the Philippines (NGCP), which is connected to an IEEC owned 69/13.8 kV substation with a single 5 MVA power transformer.

This substation supplies a 13.8 kV distribution network that comprises three 13.8 kV feeders with some interconnection between feeders. The distribution network is used to distribute electricity to distribution transformers located throughout its franchise area. The distribution transformers are used to convert the electricity to a low voltage that is used to supply the majority of IEEC’s 9,500 customers.

While the above accurately describes the essence of the IEEC’s network the following features are of note.

- While IEEC has only a single power transformer in service, it also owns a spare 10 MVA transformer that can be put into service should the energized transformer fail. However customers would be without an electricity supply during the changeover.
- There is no generation plant embedded within the IEEC electricity network or directly connected to the IEEC network.
- While the feeders are operated radially, there are a limited number of normally open interconnections between the three feeders.
- Network losses in 2008 were 12.7%, well above the loss cap of 8.5%. As these losses do not include subtransmission losses we consider them to be particularly high.
- Energy input to the IEEC network is metered at an NGCP metering point located on the 69 kV incoming line at the IEEC substation.

**2.2 CURRENT AND FORECAST ENERGY SALES AND DEMAND**

Growth in peak demand is a key driver of capital expenditure and the forecast growth in demand therefore underpins this review. If, for example, the ERC considers that the peak demand forecast in the revenue application is high, then some of the projects forecast for commissioning towards the end of the second regulatory period will not be required until after the start of the third regulatory period.

In Schedule H of its revenue application, IEEC forecast its peak demand to increase in 2.08 MW in 2009 to 2.48 MW in 2014. However, this information was inconsistent with the SKM Valuation Report, which reported a maximum demand of 3.04 MW in 2008. We therefore requested IEEC to provide metered data from its NGCP metering point.

Energy and demand data taken from this metering point is shown in Table 2.1.

**Table 2.1: Historical Energy and Demand Data**

	2005	2006	2007	2008
Energy Purchased (GWh)	15.78	15.89	16.90	17.33
Demand (MW)	3.09	3.18	3.29	3.30

Table 2.1 represents an average growth in energy purchases of 3.2% per annum and in demand of 2.3% per annum. Over the longer term we anticipate that energy and demand

will tend to grow at the same rate. If an average growth rate of 3% is assumed over the period 2005-2014 then the expected peak demand in 2014 would be 3.91 MW or 4.12 MVA, assuming a power factor of 0.95. This is well within the 5 MVA rating of IEEC's single in-service power transformer and the 6.45 MVA rating of the #2 AWG aluminum core steel reinforced (ACSR) conductor that IEEC uses for its distribution network backbone. We conclude that the existing substation and distribution network have sufficient capacity to meet expected demand over the second regulatory period and there is no requirement for major growth driven CAPEX over this time. There will however still be a need for some incremental growth driven CAPEX associated with the connection of new customers.

IEEC also stated at the clarificatory meeting that its CAPEX expenditure represented the cost of materials only. Consistent with its accounting approach, all labor and other installation costs are treated as OPEX.

**3. OVERVIEW OF HISTORICAL AND FORECAST EXPENDITURE**

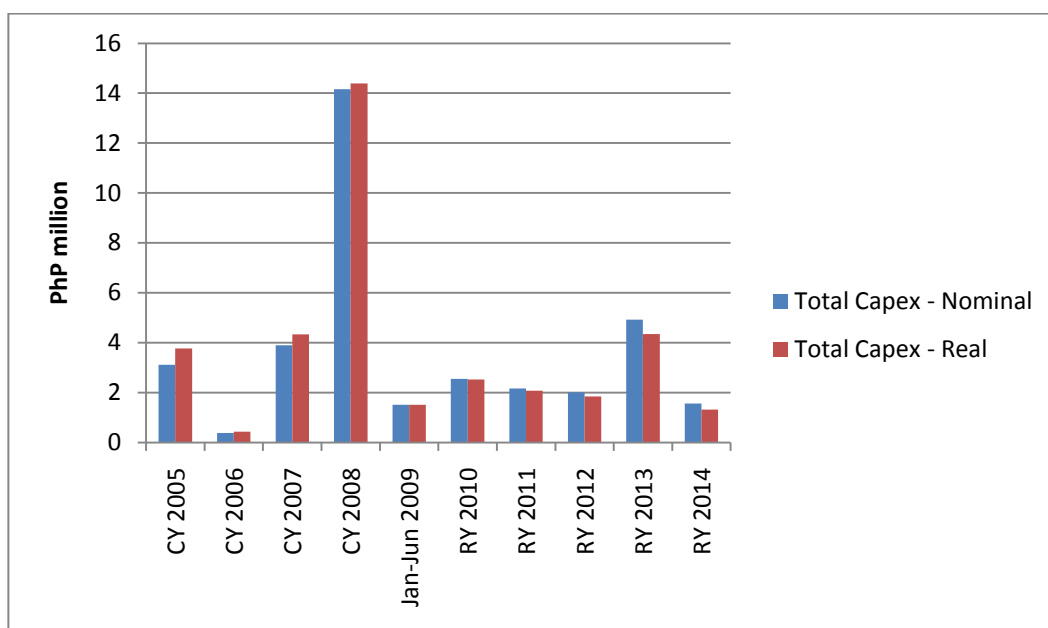
IEEC’s historical and forecast total capital expenditure (CAPEX), as presented in its revenue application, is shown in Table 3.1 below.

**Table 3.1: Total Historical and Forecast CAPEX (PhP Million)**

	Historical (Calendar Year)				Jan-Jun 2009	Forecast (Regulatory Year)				
	2005	2006	2007	2008		2010	2011	2012	2013	2014
PhP real	3.77	0.43	4.33	14.39	1.51	2.52	2.08	1.84	4.34	1.32
PhP nominal	3.11	0.38	3.90	14.16	1.51	2.55	2.17	2.01	4.92	1.56

This historical and forecast CAPEX is also shown graphically in Figure 3.1 below.

**Figure 3.1: Total Historical and Forecast CAPEX**



An examination of the information above indicates that the base year is CY 2009 since the real and nominal values are the same. For prior years nominal CAPEX is less than the same expenditure expressed in real terms while in subsequent years it is vice versa. This is to be expected in situations where the real value of the PhP depreciates over time. In this report all expenditures are expressed as PhP real, unless otherwise stated in order to remove the impact of this depreciation on our analysis.

For IEEC and the other third entry point utilities, the regulatory year starts on 1 July and finishes on 30 June. RY 2010 denotes the regulatory year ending 30 June 2010. Hence there is a six month overlap between CY 2009 and RY 2010 and expenditure budgeted to occur during this overlap period (1 July 2009 – 31 December 2009) is shown twice in the CAPEX template. This is a consequence of the ERC’s transition from calendar years to regulatory years for forecasting and rate setting purposes. However, we have corrected for this in Table 3.1 and Figure 3.1 by showing the expenditure over the period Jan-Jun 2009 rather than the full CY 2009. In deriving this number we have assumed that expenditure for CY 2009 would be incurred evenly throughout the year.

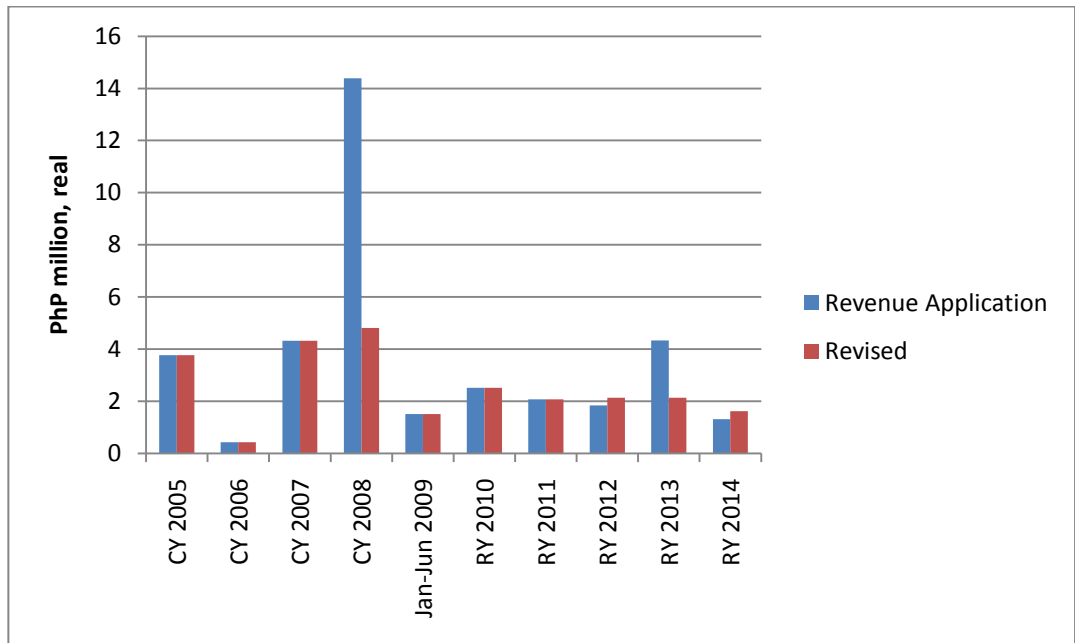
It can be seen that the reported actual expenditures in CY 2008 and RY 2013 were particularly high compared to other years and at the clarificatory meeting IEEC advised that these two numbers were in error. We therefore asked IEEC to resubmit a corrected template. While no template has been received, IEEC provided a revised forecast in the revenue application Schedule C format that corrected these errors and made other

relatively minor adjustments. A comparison of the revised forecast with the forecast submitted in the revenue application is shown in Table 3.2 and Figure 3.2.

**Table 3.2: Comparison of Revenue Application and Revised CAPEX Forecasts (PhP Million, real)**

	Historical (Calendar Year)				Jan-Jun 2009	Forecast (Regulatory Year)				
	2005	2006	2007	2008		2010	2011	2012	2013	2014
Revenue Application	3.77	0.43	4.33	14.39	1.51	2.52	2.08	1.84	4.34	1.32
Revised and recommended	3.77	0.43	4.33	4.82	1.51	2.61	2.08	2.14	2.13	1.62

**Figure 3.2: Comparison of Revenue Application and Revised CAPEX Forecasts (PhP Million, real)**



It can be seen from Figure 3.2 that, while the revised forecast CAPEX is marginally higher than in the revenue application, it is still significantly lower than in the historical period.

IEEC disaggregated its CAPEX forecast into the different template line items but not into the ERC categories of major projects, renewal, growth and refurbishment. During the clarificatory meeting, we requested IEEC to disaggregate its forecast into these categories but this did not occur. Given that most of the expenditure involves distribution line improvements of an incremental nature and that, as shown in Section 2.2, the existing network has sufficient capacity to accommodate forecast growth in demand over the regulatory period, we suggest that all expenditure be categorized as renewal for operating and maintenance expenditure (OPEX) modeling. We consider this reasonable as the growth component is unlikely to be a large proportion of the total forecast.

#### 4. REVIEW OF CAPITAL EXPENDITURE

IEEC's revised forecast expenditure provides for an average annual CAPEX of PhP2.12 Million, 37% lower than the PhP3.34 Million (real) average annual expenditure over the historical period CY 2005-08.

Approximately 73% of IEEC's forecast expenditure is in the line items *poles towers and fixtures, overhead conductors and devices, and consumer consumption metering*. The balance is on non-network items, particularly *vehicles and information technology*. There is little expenditure on other line items and, in particular, no forecast expenditure on network line transformers. We have reviewed the forecast expenditure on these major line items taking into account our expected renewal expenditure for the different line items based on the optimized replacement costs and weighted average asset lives reported in the SKM asset valuation report.

We have concerns about the size of the forecast for some line items. In particular, the forecast expenditure on consumer *meters, instruments and metering transformers* for the period RY 2010-14 represents over 47% of total CAPEX and is, in our view, in excess of the expenditure IEEC will reasonably require for this line item. Forecast expenditure on computers and other information system hardware and software represents almost 15% of total expenditure over the same period and exceeds the forecast expenditure on poles, towers and on fixtures or overhead conductors and devices. On the other hand no CAPEX is forecast for some line items where expenditure will be required over the forecast period, particularly *line transformers – distribution*.

In order to test the reasonableness of IEEC's total forecast CAPEX, we calculated the ratio of IEEC's average annual forecast CAPEX for the period RY 2010-24 to the optimized replacement cost of its asset base (excluding land) and benchmarked this against our recommended average annual forecast CAPEX of other distribution utilities entering PBR at the third entry point. We similarly benchmarked the ratio of average annual expenditure to our forecast MW peak demand in 2014. This analysis is shown in Table 4.1.

**Table 4.1: Benchmark Analysis of IEEC CAPEX Forecast (PhP Million, real)**

	ORC	Land	Difference	Average Annual CAPEX	Ratio	Forecast 2014 Demand (MW)	Average Annual CAPEX / MW
IEEC	115.39	1.19	114.20	2.12	1.9%	3.91	0.54
VECO	8,330.88	235.11	8,095.77	84.93	1.0%	384.50	0.22
DLPC	8,187.75	311.89	7,875.86	120.86	1.5%	289.40	0.42
TEI	1,304.70	109.02	1,195.68	67.80	5.7%	48.60	1.40
LUECO	591.79	11.70	580.09	29.21	5.0%	25.00	1.17
CELCOR	1,122.31	2.87	1,119.44	47.16	4.2%	33.50	1.41

It can be seen from Table 4.1 that IEEC benchmarks better than TEI, LUECO and CELCOR but not as well as VECO or DLPC. This is as expected. VECO and DLPC are larger networks having the benefits of economies of scale. Further, for both networks, the CAPEX review identified surplus capacity that can be utilized to accommodate demand growth and thus defer the need for some CAPEX until after the end of the forecast period. On the other hand TEI, LUECO and CELCOR are smaller networks, albeit significantly larger than IEEC. TEI and CELCOR had significant subtransmission or building projects included in their recommended forecast CAPEX while CELCOR's recommended forecast CAPEX included significant upgrades to its distribution network.

We recommend that the revised CAPEX forecast by IEEC for the period Jan 2009 – Jun 2014 be accepted without further modification. However, we suggest that the forecast for individual line items be reviewed and consider that IEEC should reallocate

expenditure forecast for metering and information technology to regulated distribution services - network asset line items.

## **5. SUMMARY OF RECOMMENDED TOTAL CAPITAL EXPENDITURE**

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We recommend that the revised CAPEX forecast submitted by IEEC and shown in Table 3.2 and Figure 3.2 above be accepted without further adjustment. We further recommend that all CAPEX be treated as renewal expenditure for OPEX modeling purposes.