THE INTERIM MINDANAO ELECTRICITY MARKET (IMEM) OFFER CAP

This discussion paper was prepared to provide a reference on the methodology and analysis behind the proposed IMEM Offer Cap as set forth in the IMEM Rules.

I. The IMEM Offer Cap

The Offer Cap for the Interim Mindanao Electricity Market (IMEM) is set pursuant to IMEM Rules Clause 3.3.1.10. The aforementioned clause provides that the "Offer Price [of an IMEM Resource] shall not be greater than any limit that may be agreed upon by the DOE, the ERC, and the IMEM Operator".

II. Proposed Methodology

The proposed methodology for setting the IMEM Offer Cap is to set it at the generation cost of a new generating facility that could serve the IMEM Demand after existing capacities have been taken into consideration. The proposed formula to be used in computing for the generation cost is:

$$\text{Generation Cost} = \text{Variable Cost} + \frac{\text{Fixed Cost}}{\text{Energy Output}}$$

Where,

Generation Cost - generation cost (PhP/kWh) of a new generating facility that could serve the IMEM Demand after existing capacities have been taken into consideration

Variable Cost – additional cost (PhP/kWh) incurred by a generating facility for generating an additional unit of energy (kWh)

Fixed Cost – annualized cost (PhP/year) associated with the establishment of a new generating facility that could serve the IMEM Demand after existing capacities have been taken into consideration

Energy Output – projected energy (kWh/year) production of the generating facility over a one (1) year period

III. Benchmark Facility

In computing for the generation cost that will be the basis of the IMEM Offer Cap, it is integral that the facility that will be used as the benchmark is correctly identified. The selection of the benchmark facility should take into consideration the ability of the resulting Offer Cap to compensate all generating facilities that would be needed to serve all IMEM Demand.

Given this consideration, the proposed benchmark facility for setting the IMEM Offer Cap is a new one (1) MW diesel engine generator set that an embedded IMEM Load Curtailment Resource may acquire to participate in the IMEM and provide additional energy that existing generation capacities may not provide.

IV. Inputs

Table 1 provides the assumptions used in the computation of the generation cost of the benchmark facility.

Table 1. Generation Cost Computation Assumptions.

Cost	Unit	Value	Reference
Variable Costs			
Fuel Consumption Rate	L/kWh	0.34	Revised Interruptible Load Program (ILP) Rules[1]
Fuel Cost	PhP/L	48.2	Maximum diesel price in Mindanao as of 13 August 2013[2]
Variable O&M	PhP/kWh	0.32	Revised ILP Rules
Host DU Generation Charge	PhP/kWh	4.93	Based on maximum DU rate in Mindanao[3]
Fixed Cost			
Capital Cost	PhP	22 M	DOE Modular Gen Set Program2
Interest Rate	%	15%	ERC-approved WACC for KEGI-Fibeco PSA[4]
Fixed O&M	PhP/Year	150,000	Potential ILP participant cost2
Plant Capacity	MW	1	Benchmark (See Previous Section)

V. Energy Output Simulation

Energy Output refers to the projected energy (kWh/year) production of the generating facility over a one (1) year period. In this computation, the baseline year used is 2014 as it corresponds to the year that the IMEM is operational for its whole duration. Energy output is determined by simulating the utilization of the benchmark facility given the projected demand[5], plant outage and maintenance schedule[6] and existing and future capacities in 20142. Table 2 provides a summary of the results of the simulation.

Table 2. Results of the Energy Output Simulation

Parameter	Value
System Demand (A)	10,759 GWh
System Demand Covered by Contracts (B)	10,313 GWh
Projected IMEM Demand (C = A - B)	446 GWh
IMEM Demand Covered by Unutilized Capacities (D)	415 GWh
Remaining IMEM Demand (E = C - D)	30 GWh
Projected 1 MW Facility Production (F)	378 MWh
Maximum 1 MW Facility Production (G)	8,760 MWh
Plant Utilization (H = F / G)	4.3%

Based on the simulation and applying a twenty (20) MW allowance to account for planned and forced outages of embedded facilities, the projected plant utilization for the benchmark facility is 5.3%.

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[1] ERC Resolution No. 08, Series of 2013

[2] Source: DOE

[3] Source: kuryente.org.ph as viewed last 11 September 2013

[4] Order dated 30 April 2012 on ERC Case No. 2012-027 RC

[5] Source: DOE Power Development Plan (2009-2030)

[6] NGCP's 2014 Grid Operating and Maintenance Program (GOMP)

VI.   Proposed Offer Cap

Based on the results of the computation and the simulation, it is proposed that the assumptions for the plant factor and the recovery period be 5.3% and five (5) years, respectively. The 5.3% plant factor is proposed to provide a cushion for occurrences of forced outages of generating facilities that may have provided the energy to supply the IMEM Demand. The five (5) year recovery period is then proposed since it is a reasonable estimate of the needed time for the LCRs, which will acquire a new portable diesel generator to participate in the IMEM, to recover their investment before sufficient generation capacity is available in Mindanao.

Applying the cost parameters in Section IV and the proposed plant factor and recovery period to the formula in Section II, it is thus proposed that the IMEM Offer Cap be set to PhP 36/kWh.