

Republic of the Philippines  
**ENERGY REGULATORY COMMISSION**  
Pasig City



**IN THE MATTER OF THE  
APPLICATION FOR THE  
APPROVAL OF THE PRICE  
DETERMINATION  
METHODOLOGY FOR THE  
WHOLESALE ELECTRICITY  
SPOT MARKET (WESM),**

**ERC Case No. 2017-042 RC**

**PHILIPPINE ELECTRICITY  
MARKET CORPORATION  
(PEMC)**

*Applicant,*

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**D O C K E T E D**  
Date: JUL 11 2017  
By: [Signature]

**ORDER**

On 17 May 2017, Applicant Philippine Electricity Market Corporation (PEMC) filed the instant Application for the approval of the Price Determination Methodology for the Wholesale Electricity Spot Market (“WESM”) and alleged the following:

1. This is an Application for the approval of the Price Determination Methodology for the Wholesale Electricity Spot Market (“WESM”), in accordance with the WESM Rules as amended. Section 30 of Republic Act No. 9136 otherwise known as the Electric Power Industry Reform Act of 2001 (“EPIRA”) states in part:

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Jointly with the electric power industry participants, the DOE shall formulate the detailed rules for the wholesale electricity spot market. Said rules shall provide the mechanism for determining the price of electricity not covered by bilateral contracts between sellers and purchasers of electricity users. **The price determination**

**methodology contained in said rules shall be subject to the approval of the ERC. xxx**  
(emphasis supplied)

2. Section 3(b) of Department Circular No. DC2015-10-0015 [entitled “Providing Policies for Further Enhancement of the Wholesale Electricity Spot Market (WESM) Design and Operations” issued by the Department of Energy (“DOE”)] directs PEMC to secure the approval of the Honorable Commission as regards any changes to the price determination methodology, consistent with the amended WESM Rules. A copy of DC2015-10-0015 is attached hereto as **Annex “A”**.
3. Section 3 of Department Circular No. DC2017-03-0001 [entitled “Adopting Further Amendments to the Wholesale Electricity Spot Market (WESM) Rules and Market Manuals for the Implementation of Enhancements to WESM Design and operations (Provisions for Price Determination Methodology and Constraint Violation coefficients and Pricing Re-run)"] directs PEMC to file the petition for approval of the price determination methodology with the Energy Regulatory Commission (“ERC”) A copy of DC2017-03-0001 is attached hereto as **Annex “B”**.
4. PEMC, the market operator of the WESM, is a non-stock, non-profit, private corporation duly organized and existing in accordance with Philippine laws, with principal office at the 9th/18th Floor, Robinsons-Equitable Tower, ADB Avenue corner Poveda Street, Ortigas Center, Pasig City. Applicant is represented herein by its President, Ms. Melinda L. Ocampo, who is duly authorized by PEMC's Board of Directors, as evidenced by the Secretary's Certificate attached hereto as **Annex “C”** and made an integral part of this Petition.
5. The price determination methodology contains the rules for determining the prices and schedules for dispatch, based on the offers of generation companies and demand bids from customers, taking into consideration power system conditions or constraints, consistent with a deregulated environment as provided for under the EPIRA.<sup>1</sup> It is

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<sup>1</sup> EPIRA, section 6 provides that generation is competitive and open.

a rule of general application, applying to all trading participants in the WESM. Since the price determination methodology is essentially part of an auction process, price outcomes are determined by behavior and system conditions, not by the price determination methodology. Thus, this petition does not seek to set an electricity rate directly chargeable to the consumers.

6. It must be noted that the price determination methodology originally approved by the Honorable Commission in 2006 followed a rate case procedure owing to the then lack of procedure on rule making by the Commission.<sup>2</sup>
7. The following issuances of the Honorable Commission contain the rules on pricing and settlements for the WESM:
  - a) Decision dated 20 June 2006 in ERC Case No. 2006-007RC, approving the Price Determination Methodology;
  - b) Orders dated 6 February 2008, 9 June 2008 and 11 May 2009 in ERC Case No. 2006-007RC approving the use of the Generation Price Index (GPI) for compensation of must-run units;
  - c) Decision dated 22 June 2006 in ERC Case No. 2005-056RC approving the Administered Price Determination Methodology (APDM) to be used during market suspension or intervention;
  - d) Decision dated 16 February 2009 in ERC Case No. 2008-51 RC approving the Price Substitution Methodology to be applied in cases of large disparities in nodal prices arising from network congestion;
  - e) ERC Resolution No. 6 Series of 2009, captioned "A Resolution Adopting the

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<sup>2</sup> The current ERC Rules of Practice and Procedure was promulgated by the Commission on 22 June 2006. The rules of procedure being used at the time the application for approval of the price determination methodology was filed on 22 February 2006 was the Rules of Practice and Procedure Governing Hearings before the Energy Regulatory Board, which did not provide an equivalent procedure for rule-making.

Rules for the Distribution of Net Settlement Surplus”

- f) Decision dated 7 July 2008 in ERC Case No. 2007-004RC relating to the pricing and cost recovery for reserves in the WESM;
8. On the other hand, there are pending applications before the Commission for the approval of the pricing and cost recovery mechanism for reserves in ERC Case No. 2007-004 RC, amendments to the APDM in ERC Case No. 2015-163 RC, and approval of the settlement of displaced generators in ERC Case No. 2016-159 RC.
9. The attached price determination methodology shall amend and supersede all the afore-mentioned issuances of the Commission, including Resolution No. 6, series of 2009. Thus, should the Honorable Commission treat this application as a rate case, it must in addition, treat the same as one for petition to initiate rule-making under Rule 21 of the ERC Rules of Practice and Procedure, which provides as follows:

Section 1. Initiation of Rule-making.- The process of **adopting a new rule of amending or repealing an existing rule** may be initiated by the Commission or by interested persons upon a petition for issuance, amendment, or repeal of any rule.

Section 2. Petition to Initiate Rule-making. – Interested persons may petition the Commission to adopt, amend, or repeal a rule by filing a petition to initiate rule-making.

### **BACKGROUND**

10. Section 30 of the EPIRA directed the establishment of the WESM within one year from effectivity of the law. After the passage of the law in 2001, PEMC was organized to act as the market operator of the WESM. Thereafter commercial operations commenced in Luzon on 26 June 2006, and in the Visayas on 26 December 2010.

11. The WESM is a real-time, gross pool, bid-based, mandatory market adopting locational marginal pricing or nodal pricing and net settlement.
  - 11.1 Under the WESM Rules, the market is designed as decentralized, where generators are responsible for self – commitment decisions and must manage their fuel and energy limitations through their offers in the market;
  - 11.2 The market operator is responsible for generating the prices and schedules of generating and load facilities<sup>3</sup> using an optimization process taking into consideration actual system constraints;
  - 11.3 The system operator provides the central dispatch of all generation and load facilities based on the dispatch schedule submitted by the market operator;<sup>4</sup>
  - 11.4 Trading intervals in the WESM are on an hourly basis with *ex ante* dispatch and pricing, and *ex post* pricing to account for the discrepancies between the planned and actual outcomes;<sup>5</sup>
  - 11.5 Locational marginal pricing is used to provide price signals, taking into account marginal cost of transmission losses and constraints;
  - 11.6 Declared bilateral contract quantities are netted out of settlement.
12. The WESM is governed by the WESM Rules issued by the DOE as a department circular, after joint formulation with the electric power industry participants. The price determination methodology

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<sup>3</sup> Section 30 of the EPIRA provides that the WESM Rules shall provide the mechanism for determining the price of electricity not covered by bilateral contracts, and the merit order dispatch instructions for each time period

<sup>4</sup> EPIRA, section 9(e)

<sup>5</sup>As discussed later in this Petition, it is proposed to shorten the trading interval from one hour to five minutes, and to adopt *ex ante* only pricing.

contained in the WESM Rules is subject to approval by the ERC.<sup>6</sup>

### WESM DESIGN ENHANCEMENTS

13. Under the WESM Rules, the market operator undergoes annual audits of its operations, systems and procedures.<sup>7</sup> In the first and second market operations audits, the external auditors identified a number of issues pertaining to market design which undermined the efficiency of the market.
14. To address these issues, PEMC commissioned a market design study in 2013 and engaged Intelligent Energy Systems Pty. Ltd., SW Advisory and Ross Baldick to conduct the WESM Design Study (“WDS”) in phases, which included the following:
  - a) Phase 1 would review the audit findings as regards the forced dispatch of a generating unit’s minimum stable load (Pmin), compliance with the must-offer rule and constraint violation coefficient values; and.
  - b) Phase 2 would provide technical assistance in assessing the feasibility of shortening the one-hour trading interval.
15. Several consultations were held with the various WESM Members during the months of April, August and November 2013. The final reports incorporating the comments from the stakeholders<sup>8</sup> were submitted to the DOE on 12 February 2014. Copies of the reports were thereafter posted on the WESM market information website<sup>9</sup>.

A copy of the presentation material summarizing the comments obtained from stakeholders and the responses of the consultants is attached hereto as **Annex “D”**.

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<sup>6</sup> EPIRA, section 30

<sup>7</sup> WESM Rules, section 1.5.2

<sup>8</sup> Annex C of the Phase 2 report contains a matrix summarizing stakeholder comments

<sup>9</sup> Copies available at [http://www.wesm.ph/inner.php/downloads/market\\_studies](http://www.wesm.ph/inner.php/downloads/market_studies)

16. On 23 October 2015, the DOE issued Department Circular No. DC2015-10-0015<sup>10</sup> adopting certain recommendations of the studies, including the shortening of the dispatch interval to five minutes, ex ante only pricing and automated pricing corrections. Section 3(a) of the circular likewise directed PEMC to submit the necessary rules change proposals to the Rules Change Committee.<sup>11</sup>
17. Based on the foregoing, PEMC submitted a rules change proposal to the Rules Change Committee on 01 December 2015. These changes were deliberated on and approved by the Rules Change Committee, then by the PEMC Board, after which it was transmitted to the DOE for its approval. On 14 October 2016, the DOE approved the amendments to the WESM Rules by issuing Department Circular No. DC2016-10-0014, a copy of which is attached hereto as **Annex "E"**.
18. On 27 May 2016, PEMC submitted the detailed formulation of the price determination methodology to the Rules Change Committee. The submitted price determination methodology was formulated based on Department Circular No. DC2016-10-0014 and consolidated all pricing methodologies in the various WESM Manuals and ERC issuances. On 1 June 2016, PEMC presented the price determination methodology to the Rules Change Committee and thereafter it was posted on the market information website<sup>12</sup> for comments.
19. Comments on the proposal were received from the DOE, WESM Technical Committee, Aboitiz Power and SN Aboitiz Power (SNAP). The Rules Change Committee deliberated on the same in meetings held on 7 September, 5 October and 26 October 2016 after which the amended price determination methodology was approved.

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<sup>10</sup> See Annex "A"

<sup>11</sup> Under the WESM Rules section 8.2.2.1 in relation to section 1.4.2, the Rules Change Committee is composed of representatives from the generation, distribution, supply and transmission sector, together with a representative from the market operator, and members that are independent of the electric power industry. The rules change process under chapter 8 of the WESM Rules is consistent with section 30 of the EPIRA which provides that the WESM Rules shall contain, among others, procedures for amending the rules.

<sup>12</sup> See ORCP-WM-16-17 in [http://www.wesm.ph/inner.php/downloads/rcc\\_open\\_topics](http://www.wesm.ph/inner.php/downloads/rcc_open_topics)

A copy of the Rules Change Committee Resolution No. 2016-13 sans the annexes is attached hereto as **Annex “F”**.

- 19.1 One of the changes in response to the comments was the reformulation of the trading amount. PEMC had originally proposed to use a weighted average price for an hour to be multiplied by the hourly metered quantity. SN Aboitiz Power had proposed to compute trading amounts based on the prices and quantities corresponding to dispatch intervals; that is, to simply multiply every five minute dispatch price by a five minute metered quantity, to reflect more accurate settlements amounts. This change was approved by the Rules Change Committee.<sup>13</sup>
20. Once approved by the PEMC Board, the proposal was submitted to the DOE for approval. On 20 Mar 2017, the DOE issued Department Circular No. DC2017-03-0001 approving the price determination methodology.<sup>14</sup>
21. On 20 February 2017, PEMC submitted an urgent rules change proposal<sup>15</sup> to the Rules Change Committee as regards the price determination methodology on the following:
- a) Deletion of the provision stating that the administered price will only be applied to an isolated portion of the grid under market suspension or intervention since the system operator does not declare market intervention for only a portion of the grid, and because prices and schedules can now be determined for isolated portions of the grid;

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<sup>13</sup> See discussion in the Minutes of the Rules Change Committee on its 119<sup>th</sup> Meeting on 5 October 2015 in [http://www.wesm.ph/inner.php/downloads/rcc\\_meeting\\_minutes](http://www.wesm.ph/inner.php/downloads/rcc_meeting_minutes)

<sup>14</sup> See Annex “B”, which has the following attachments: the Price Determination Methodology Manual Issue 1.0 and the Constraint Violation Coefficients and Pricing Re-runs Manual Issue 5.0

<sup>15</sup> WESM Rules, section 8.4.1.1(a), and section 8.4.1.2. Urgent rules changes are effective once approved by the PEMC Board for a period of six months.



- b) Correction of the formula for administered prices to ensure that there is no cross-subsidy; and
  - c) Entitlement of constrain-on<sup>16</sup> generating units to additional compensation, similar to must-run units.
22. The urgent amendment was approved by the Rules Change Committee and endorsed to the PEMC Board for approval.

A copy of the Rules Change Committee Resolution approving the urgent amendments is attached hereto as **Annex "G"**.

23. In summary, the following changes to the WESM design have a direct bearing on the price determination methodology:
- a) Shortening of scheduling and pricing intervals from one hour to five minutes, and ex ante only pricing to better reflect the changes in supply and demand, and potentially reduce the requirement for frequency regulation reserve;
  - b) Automatic re-runs when prices reflect constraint violations, to provide timely disclosure of settlement-ready prices<sup>17</sup>; and
  - c) Hour-ahead projections (in addition to the week-ahead and day-ahead projections) to facilitate commitment decisions of trading participants.
24. This price determination methodology continues to adhere to the same design principles as the original WESM design, summarized as follows:
- a) Gross pool market, where generator trading participants offer their maximum available capacity for central

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<sup>16</sup> Defined under the WESM Rules as "[i]n respect of a *generating unit*, the output of that *generating unit* is re-dispatched by the System Operator above its *Real-Time Dispatch schedule in accordance with the WESM Merit Order Table*."

<sup>17</sup> Except in cases of Administered Prices, Price Substitution and application of the Secondary Price Cap under ERC Resolution No. 20, series of 2014

- scheduling and dispatch, ensures system security and a level-playing field among generators;
- b) Net settlement, where bilateral contract quantities are settled outside the WESM;
  - c) Co-optimized energy and reserves, where the provision of energy and reserves are jointly optimized by the Market Dispatch Optimization Model;
  - d) Self-commitment, where trading participants are responsible for the management of their technical operations, unit commitment decisions and other market risks through submission of offers to the WESM; and
  - e) Locational marginal pricing to provide price signals, taking into account marginal cost of transmission losses and constraints.

## **PRICE DETERMINATION METHODOLOGY**

- 25. The price determination methodology sets forth the specific details on how the dispatch schedules and locational marginal prices are calculated in the Market Dispatch Optimization Model (“MDOM”), pursuant to Section 3.6 of the WESM Rules, including the determination of prices in times of extreme nodal price separation and market suspension and intervention, pursuant to Sections 3.12.7 and 6.2.3 of the WESM Rules respectively.
- 26. In addition to providing the details for determining prices and schedules, the price determination methodology also provides the details for calculating settlement amounts net of bilateral contracts in accordance with Section 3.13 of the WESM Rules.
- 27. The herein proposed price determination methodology consolidates and amends all prior issuances of the Honorable Commission as regards price determination and settlement in the WESM.

A copy of the price determination methodology is attached as part of DC2017-03-0001.<sup>18</sup>

28. The following sections discuss the highlights of the rules.

***I. Scheduling and Pricing of Energy and Reserves***

**A. Market Dispatch Optimization Model**

29. Prices and schedules for each dispatch interval, as well as the results for the week-ahead, day-ahead and hour ahead projections, are calculated using the MDOM.
30. The MDOM is a mathematical algorithm, with an objective function that maximizes economic gain derived from electricity trades, while taking into consideration system constraints to produce security constrained economic dispatch (“SCED”) schedules. In this manner, the technical and economic structure of the system are aligned so that pricing mechanisms provide incentives consistent with the optimal use of the system<sup>19</sup>.
31. The objective function is calculated by maximizing the value of dispatched load based on demand bids, while minimizing the costs of:
- a) Dispatched generation based on offers;
  - b) Dispatched reserves based on offers;
  - c) Load curtailment; and
  - d) Constraint violations based on constraint violation coefficients.<sup>20</sup>
32. While the formulation is slightly different from what is currently approved for the WESM, the results are mathematically equal, such that the

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<sup>18</sup> See Annex “B”

<sup>19</sup>PHB Hagler Bailly Asia Pacific Limited, Market Rules Discussion Papers: Pricing and Dispatch, 23 June 2000

<sup>20</sup> Price Determination Methodology, section 4.4.1

resulting solution is the least cost supply of electricity with regard to system security.

33. Prices and schedules will be produced by the MDOM simultaneously for Luzon, Visayas, and Mindanao. Since Mindanao is, as of yet, not connected to the Luzon and Visayas grids, prices and schedules in the Mindanao grid would not be affected by the demand and generation offers from the Luzon and Visayas grids and vice versa. Upon the establishment of the Visayas-Mindanao interconnection, the MDOM will automatically produce prices and schedules based on the demand and generation offers of the whole grid.

B. Preferential Scheduling

34. In view of the implementation of must dispatch under Republic Act No. 9513 otherwise known as the Renewable Energy Act of 2008, the price determination methodology provides that in the event that dispatch targets need to be restricted, the MDOM shall consider the following hierarchy when a combinations of groups are to be restricted:

- a) Market offers of scheduled generating units;
- b) Non-scheduled generating units;
- c) Priority dispatch generating units; and
- d) Must dispatch generating units.<sup>21</sup>

35. The hierarchy assures that generating units under the Feed-in Tariff (FIT) system and those with intermittent renewable energy resources are prioritized in the scheduling, pursuant to sections 7 and 20 of RA 9513, and is consistent with section 3.6.1.8 of the WESM Rules.

C. Automatic Pricing Re-runs

36. To address the need to produce settlement-ready prices in a timely manner, automatic pricing re-runs are introduced for greater market efficiency. This will be done by relaxing the constraints by the value

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<sup>21</sup>Price Determination Methodology, section 4.7

of the constraint violation and a very small value<sup>22</sup> so that settlement-ready prices are produced near real-time, with approximately the same dispatch schedule.<sup>23</sup>

37. In the event of under-generation and over-generation, then the price shall be the shortage price equivalent to the offer price cap for under-generation, and excess price equivalent to the offer price floor for over-generation, to provide clear price signals for actual system conditions.<sup>24</sup> The currently approved offer price cap and floor is reflected in the Tripartite Resolution No. Joint Resolution No.3, series of 2015 as PhP32,000.00/MWh and PhP-10,000.00/MWh respectively.
38. Manual pricing re-runs shall only be conducted in the event of erroneous or bad data in accordance with section 3.10.5 of the WESM Rules.<sup>25</sup>

#### D. Price Substitution Methodology

39. Until the establishment of financial transmission rights to enable participants to better manage the risks from the effects of congestion, extreme nodal price separation due to congestion shall be mitigated through the use of substituted prices for the affected generators and customers, in accordance with Section 3.12.17 of the WESM Rules.
40. Price substitution shall be triggered during network congestion,<sup>26</sup> when the computed price spread of the nodes in a particular region, or trigger factor, exceeds 0.2.<sup>27</sup> The threshold may be revised from time to time, subject to the evaluation of the Technical Committee.
41. As with the previous trigger factor, the proposed trigger factor provides a threshold for the spread of nodal prices during network congestion. Unlike the previous trigger factor which used the ratio of the

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<sup>22</sup> The value of the delta is provided in the WESM Manual on Constraint Violation Coefficients (CVC) and Pricing Re-runs, Issue No. 5. See Annex "B".

<sup>23</sup> Price Determination Methodology, sections 5.2.2 and 5.2.3

<sup>24</sup> Price Determination Methodology, section 5.2.4

<sup>25</sup> Price Determination Methodology, section 5.3.1

<sup>26</sup> Price Determination Methodology, section 6.2.1

<sup>27</sup> Price Determination Methodology, section 6.2.4.

highest locational marginal price to the highest market clearing price, the proposed trigger factor is computed using a weighted standard deviation formula.<sup>28</sup> The change in the trigger factor is being proposed to remove the market clearing price (or “MCP”) as the basis of nodal price spread. This revised formula is more appropriate when the reserves are integrated in the WESM.

42. Generator prices shall be determined similar to the previous price substitution methodology. Energy prices from an unconstrained solution shall be used for generator prices,<sup>29</sup> but the generator which was scheduled to address the congestion shall be paid at the price corresponding to its scheduled MW offer.<sup>30</sup>
43. Similarly for reserves, prices of reserves shall be calculated using the sum of the constrained solution’s marginal reserve offer price and the unconstrained solution’s opportunity cost.<sup>31</sup> This is to mitigate the transfer of extreme congestion cost to the reserve prices.
44. Currently, customer settlement amounts are directly calculated by pro-rating the total payable amount to generators based on the customer’s metered and bilateral contract quantities. However, this process cannot be done near real-time because metered quantities and bilateral contract quantities are only available after the trading day. In order to provide near real-time price information, it is proposed that a customer price shall be calculated by dividing the sum of all generator substitute prices multiplied by their respective schedules, by the sum of all customer schedules.<sup>32</sup>
45. In cases where the HVDC is on outage, or there is no interconnection between regions, or if the HVDC has a zero schedule, price substitution shall only apply to the region affected by congestion. This differs from the current regional application which applies regional price substitution if the HVDC is scheduled at either zero or at its maximum limit. The rationale behind this shift is the fact that for as

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<sup>28</sup> Price Determination Methodology, section 6.2.3

<sup>29</sup> Price Determination Methodology, sections 6.3.1 and 6.3.3

<sup>30</sup> Price Determination Methodology, section 6.3.2

<sup>31</sup> Price Determination Methodology, section 6.5.2

<sup>32</sup> Price Determination Methodology, section 6.4.1

long as regions are sharing power through an interconnection, congestion affects the nodal prices in those regions as well, which warrants the application of price substitution. This is consistent with the intent to apply price substitution only to the region affected by the congestion. Since the Mindanao grid is not currently interconnected, it will be treated separately.

E. Administered Prices

46. Administered prices shall be used in the WESM in the particular grid (i.e. Luzon, Visayas or Mindanao) where market intervention or market suspension is declared.<sup>33</sup>
47. Administered prices for generators use a weighted average based on the last four (4) nodal prices and snapshot quantities (instead of metered quantities which are available only after the trading day) in the most recent similar trading days and similar dispatch intervals. If there was market intervention or suspension in the last four similar trading days and dispatch intervals, prices during such time will be excluded from the average.<sup>34</sup>
  - 47.1 If all the last four prices were administered prices, the weighted average of those prices and snapshot quantities shall be used.<sup>35</sup>
  - 47.2 If all the snapshot quantities are equal to zero, then a simple average of the prices will be used.<sup>36</sup>
48. In the event there are no available prices available for the generator (whether administered or not), the generator weighted average price shall be used.<sup>37</sup>
49. Reserve administered prices are calculated similarly to energy administered prices, however historical reserve dispatch schedules are used instead of snapshot quantities.<sup>38</sup> In case of market

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<sup>33</sup> WESM Rules, section 6.2.3, Price Determination Methodology, section 7

<sup>34</sup> Price Determination Methodology, section 7.2.4 (a)

<sup>35</sup> Price Determination Methodology, section 7.2.5 (a)

<sup>36</sup> Price Determination Methodology, section 7.2.4 (b) and 7.2.5 (b)

<sup>37</sup> Price Determination Methodology, section 7.2.6

<sup>38</sup> Price Determination Methodology, section 7.4

intervention or suspension however, the system operator must provide the capacities that were nominated as reserves to the market operator for settlement.

50. On the customer side, administered prices are based on snapshot quantities, and not metered quantities so that prices are derived near real-time, instead of at the end of the billing month when metered quantities are available. The customer administered price is determined by dividing the sum of the product of all generator administered prices multiplied by their snapshot quantities, by the total customer snapshot quantities.<sup>39</sup>
51. Since the declaration of market suspension or intervention may be regional, the methodology likewise accounts for the imports from one region to another.
  - 51.1 If the region under market intervention or suspension is importing power from a region which is not under market intervention or suspension (or non-administered region), the customer energy administered price is further adjusted by adding the quantity imported multiplied by the generator weighted average price in the non-administered region before dividing by the total customer snapshot quantity.<sup>40</sup> This ensures that the normal prices in the exporting non-administered region prevail, even if the said region is exporting to the administered region.
  - 51.2 Corollary to this, if the region under market intervention or suspension is exporting power to a non-administered region, then customer energy administered price is further adjusted by subtracting the quantity exported multiplied by the generator weighted average energy administered price

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<sup>39</sup> Price Determination Methodology, section 7.3.1

<sup>40</sup> Price Determination Methodology, section 7.3.2



before dividing by the total customer snapshot quantity.<sup>41</sup>

51.3 On the other hand, the customer nodal energy prices of the non-administered region, when importing from a region under market intervention or suspension, are adjusted to account for the difference in price of the quantity imported from the administered region. The amount of the adjustment, which is to be subtracted from the customer nodal energy prices, is computed by multiplying the difference between the generator weighted average price in the non-administered region and the generator weighted average administered price by the quantity imported, and dividing the product by the total customer energy dispatch schedules in the non-administered region.<sup>42</sup> The correct formula is reflected in the urgent rules change proposal.

52. Generating units may claim for additional compensation if their costs are higher than the administered price, by submitting proof as to the fuel and variable operating and maintenance costs. This is collected from the customers pro rata in the region where the market intervention or suspension is declared.<sup>43</sup>

#### F. Reserve Prices

53. Reserve and energy dispatch schedules and prices shall be determined in a co-optimized manner in the MDOM, for each reserve category in each reserve region.

54. The reserve regions shall initially consist of the Luzon, Visayas and Mindanao grids. Visayas was treated as a single reserve region since dividing it into multiple reserve zones will result in higher reserve requirements and accordingly, higher reserve costs as compared to a single reserve region.

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<sup>41</sup> Price Determination Methodology, section 7.3.3

<sup>42</sup> Price Determination Methodology, section 7.3.4

<sup>43</sup> Price Determination Methodology, section 8.3

55. While reserve categories have yet to be finalized pending further issuances of the Honorable Commission implementing the changes in the 2016 Philippine Grid Code<sup>44</sup>, the reserve categories for the purpose of determining the cost recovery are generic, i.e., regulating reserve (equivalent to secondary reserves)<sup>45</sup> and raise and lower contingency reserve (primary<sup>46</sup> or tertiary reserves<sup>47</sup>). The introduction of lower reserve services in response to over-frequency situations is consistent with the Order dated 7 July 2008 in ERC Case No. 2007-004RC where the Commission stated that the same would improve robustness of operations.

**G. Treatment of Must-Run Units**

56. Previously must-run units were compensated using the Generation Price Index (GPI). Under the proposal, must-run units shall be treated as price-takers but shall be entitled to claim additional compensation on their variable costs.
57. Under the Dispatch Protocol Issue 11, there are three (3) criteria for designating must-run units:
- a) system voltage requirements;
  - b) re-dispatch of generators affected by actual thermal limits of transmission lines; and
  - c) real-power balancing and frequency control, when available ancillary services have been exhausted;
58. The first ground is in the nature of an ancillary service and is classified as such under the Philippine

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<sup>44</sup> ERC Resolution No. 22, series of 2016

<sup>45</sup> Defined under the 2016 Philippine Grid Code as "Synchronized generating capacity that is allocated to restore the system Frequency from the quasi-state value as established by the Primary Responses of Generating Units to the nominal Frequency of 60Hz."

<sup>46</sup> Defined under the 2016 Philippine Grid Code as "Synchronized generating capacity that is allocated to stabilize the system Frequency and to cover the loss or failure of a Synchronized Generating Unit or a transmission line or the power import from a single circuit interconnection".

<sup>47</sup> Defined under the 2016 Philippine Grid Code as "The capacity which can be connected (automatically or manually) under Tertiary Control, in order to provide an adequate Secondary Reserve. This reserve must be used to contribute to the restoration of the Secondary Control range when required. xxx"

Grid Code.<sup>48</sup> Hence, it should be compensated as an ancillary service by the system operator, and for its incidental energy from the WESM.

59. The second ground is for cases where the MDOM is unable to consider thermal limits in situations such as, but not limited to, constrained feeders that are not included in the market network model.
60. It is anticipated that the third ground, which warrants a re-dispatch of generators, shall be rarely needed since schedules are determined every five minutes. Also, the change in dispatch intervals from one hour to five minutes potentially reduces the amount of load-following ancillary services.
61. The must-run unit volume is computed as the difference between the metered quantity and the bilateral contract quantity.<sup>49</sup> Must-run units are likewise entitled to claim additional compensation in the same manner as generating units claiming for additional compensation during market intervention or suspension.<sup>50</sup> This is collected from the customers pro rata in the region where the must-run unit is located.
62. In the urgent rules change amendment, the Rules Change Committee amended the price determination methodology such that constrain-on generators were likewise entitled to additional compensation, in the same manner as must-run units. Constrain-on generators are defined under the WESM Rules as “[i]n respect of a generating unit, the output of that generating unit is re-dispatched by the System Operator above its Real-Time Dispatch schedule in accordance with the WESM Merit Order Table.” As with must-run units, constrain-on units are only re-dispatched when reserves are depleted.<sup>51</sup>

#### H. Mitigating Measures

63. While not within the Price Determination Methodology itself, the following mitigating

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<sup>48</sup> Reactive Power Support

<sup>49</sup> Price Determination Methodology, section 8.3.5

<sup>50</sup> Price Determination Methodology, sections 8.3.1 and 8.3.2

<sup>51</sup> WESM Rules, 3.8.2.1(e)

measures set in other issuances will continue to apply, until otherwise revised or amended:

63.1 The offer price cap of PhP32,000.00 per MWh and floor of PhP -10,000.00 per MWh as set by Joint Resolution No. 3 Series of 2015; and

63.2 ERC Resolution No. 20, series of 2014 setting a price cap in the market of PhP6,245.00 per MWh, if the rolling Generator Weighted Average Prices (GWAP) reaches PhP9,000.00 per MWh over a period of seven (7) days.

64. Since both resolutions apply system wide, they shall likewise be applicable to Mindanao. ERC Resolution No. 20, series of 2014 shall be implemented by including Mindanao prices in computing the rolling Generator Weighted Average Prices (GWAP).

## ***II. Settlement***

### ***A. Trading Amounts***

65. In view of the shortening of the dispatch interval, ex post prices are no longer necessary to account for the imbalances at the end of the dispatch interval. The energy trading amount for each five-minute dispatch interval simply becomes price multiplied by the metered quantity. The formula net of bilateral contracts becomes as follows:

$$\text{Energy Trading Amount} = FEDP_B \times MQ - FEDP_S \times BCQ$$

Where:

*FEDP<sub>B</sub>* refers to the final energy dispatch price of the generator or customer

*MQ* refers to the metered quantity

*FEDP<sub>S</sub>* refers to the reference final energy dispatch price for the bilateral contract quantity declared

*BCQ* refers to the bilateral contract quantity

66. Payment and collection of Energy Trading Amounts will be performed on a system-wide basis. Hence,

payments of trading participants to the WESM will be spread system wide upon collection.

67. Currently, since Mindanao is not physically connected to the Visayas grid, and because the WESM is not yet operational, power supply agreements of distribution utilities are entered into only with generating units in Mindanao. It will be possible to enter into supply agreements however, with generating units who are not located in Mindanao, where essentially such generator will be purchasing from the Mindanao market on behalf of the customer, if such power supply agreement is approved by the Honorable Commission.
68. The reserve trading amount for a reserve provider, in a particular reserve category in a dispatch interval, is likewise computed as reserve price times the reserve quantity, less any reserve quantity covered by bilateral contracts divided by twelve, or the number of dispatch intervals in one hour:

$$\text{Reserve Trading Amount} = \frac{1}{12} [RDP \times (RDS - RBCQ)]$$

Where:

*RDP* refers to the reserve dispatch price  
*RDS* refers to the reserve dispatch schedule  
*RBCQ* refers to the reserve bilateral contract quantity

69. The cost recovery methodology for reserves employs a causer pays approach:
- 69.1 The reserve cost for regulating reserve in each reserve region, shall be pro-rated based on the metered quantities of all trading participants, as all trading participants contribute to the disruptions in frequency.
- 69.2 The reserve cost for raise contingency reserves shall be allocated to generators using a runway approach. The cost of scheduling raise contingency reserves is allocated to generators, since these scheduled generating units were the

reason for having these raise reserves due to their potential loss (or tripping) The runway approach also ensures that the reserve costs are equitably allocated, such that the cost is recovered from generating units that contribute more to the level of scheduled contingency reserves.

69.3 The reserve cost for lower contingency reserves shall be recovered from all loads based on metered quantities, since the costs for lower contingency services are based on the loss of large loads.

70. The cost recovery for reserves is the same, when there is price substitution or market intervention or suspension.
71. As mentioned previously, there is a pending case for approval of the settlement of must stop units and displaced generators who are defined to be generating units identified and instructed by the system operator in an out of merit dispatch to reduce the provision of energy specified in its real time dispatch instruction exclusively caused by excess generation due to non-compliance of generators to dispatch instructions.<sup>52</sup> The displaced generator is entitled to payment equivalent to the difference between the ex ante quantity and metered quantity of the displaced generator multiplied by the ex post price. This payment shall be collected from the must stop units in proportion to their imbalance.
72. With the shortened dispatch interval and the implementation of the reserve market, intra-hour excess and displaced generation will be significantly minimized since schedules are provided more frequently. Moreover, the mechanism can no longer be applied since the calculation relies on ex post prices for the determination of the imbalance. Hence, this mechanism is not carried over as a proposal in the price determination methodology.

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<sup>52</sup> ERC Case No. 2016-159 RC

B. Net Settlement Surplus

73. Due to the nature of nodal pricing, a surplus or deficit may arise after all market transactions have been accounted for. Net settlement surplus (“NSS”) is flowed back to the trading participants based on their contribution to the total line loss and congestion costs.
74. NSS is calculated as the difference between the total amount to be collected from the trading participants and the total amount to be paid by the trading participants for each dispatch interval.<sup>53</sup>
75. Consistent with ERC Resolution No. 6 series of 2009, NSS is allocated for every dispatch interval based on the ratio of the trading participant’s loss and congestion charges (“LLCC”) to the total LLCC of all trading participants in the said dispatch interval.<sup>54</sup> LLCC shall be computed as the taking into consideration each bilateral contract, as follows:

$$LLCC = LLCP \times MQ - LLCP_s \times BCQ$$

Where:

- LLCC* refers to the line loss and congestion charges of a particular trading participant in a dispatch interval in relation to a particular bilateral contract
- MQ* refers to the metered quantity of the trading participant
- LLCP<sub>s</sub>* refers to the line loss and congestion price of the reference node for the bilateral contract
- BCQ* refers to the bilateral contract quantity<sup>55</sup>

76. NSS is allocated system wide to all participants entitled to the same, whether situated in Luzon, Visayas or Mindanao, and is not allocated separately for Luzon, Visayas or Mindanao.

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<sup>53</sup> Price Determination Methodology, section 9.2.1

<sup>54</sup> Price Determination Methodology, section 9.4.2

<sup>55</sup> Price Determination Methodology, section 9.4.2(b)

**PRAYER**

WHEREFORE, premises considered, PEMC respectfully prays that that the attached Price Determination Methodology be APPROVED, PROMULGATED and PUBLISHED in accordance with applicable law.

PEMC prays for such other reliefs just and equitable under the premises.

Finding the said Application sufficient in substance with the required fees having been paid, the same is hereby set for initial hearing for determination of compliance with the jurisdictional requirements, expository presentation, Pre-trial Conference, and presentation of evidence on the following dates:

<b>Date and Time</b>	<b>Venue</b>	<b>Hearing Coverage</b>
<b>31 July 2017 (Monday)  Ten o'clock in the morning (10:00 A.M.)</b>	ERC Hearing Room, 8 <sup>th</sup> Floor Pacific Center Building, San Miguel Avenue, Ortigas Center, Pasig City	Jurisdictional and Expository Presentation
<b>2 August 2017 (Thursday)  Ten o'clock in the morning (10:00 A.M.)</b>	Visayas Field Office, St. Mary's Drive, Banilad, Cebu City	Expository Presentation
<b>4 August 2017 (Friday)  Ten o'clock in the morning (10:00 A.M.)</b>	ERC Mindanao Field Office, Mintrade Bldg., Monteverde Ave. cor Sales St., 8000 Davao City	Expository Presentation

Accordingly, Applicant PEMC is hereby directed to:

- 1) Cause the publication of the attached Notice of Public Hearing in two (2) newspapers of nationwide circulation in the Philippines at their own expense, twice (2x) for two (2) successive weeks, the dates of publication not being less than seven (7) days apart and the date of the last publication to be made not



later than ten (10) days before the date of the scheduled initial hearing;

- 2) Furnish with copies of this Order and the attached Notice of Public Hearing the Offices of the the City Mayor and the Local Government Unit (LGU) legislative body of Pasig City for the appropriate posting thereof on their respective bulletin boards;
- 3) Inform of the filing of the Application, its reasons therefor, and of the scheduled hearing thereon, the consumers within the affected area, by any other means available and appropriate;
- 4) Furnish with copies of this Order and the attached Notice of Public Hearing, the Office of the Solicitor General (OSG), the Commission on Audit (COA), and the Committees on Energy of both Houses of Congress. They are hereby requested, if they so desire to send their duly authorized representatives at the scheduled hearing; and
- 5) Furnish with copies of the Application and its attachments all those making requests therefor, subject to reimbursement of reasonable photocopying costs.

On the date of the initial hearing, Applicant PEMC must submit to the Commission its written compliance with the aforementioned jurisdictional requirements attaching therewith, methodically arranged and duly marked the following:

- 1) The evidence of publication of the attached Notice of Public Hearing consisting of affidavits of the Editors or Business Managers of the newspapers where the said Notice of Public Hearing was published, and the complete issues of the said newspapers;
- 2) The evidence of actual posting of this Order and the attached Notice of Public Hearing consisting of certifications issued to that effect, signed by the aforementioned Mayor and LGU legislative body or their duly authorized representatives, bearing the seals of their offices;

- 3) The evidence of other means employed by Applicants to inform of the filing of the Joint Application, its reasons therefore, and of the scheduled hearing thereon, the consumers within the affected franchise area;
- 4) The evidence of receipt of copies of this Order and the attached Notice of Public Hearing by the Office of the Solicitor General (OSG), the Commission on Audit (COA), and the Committees on Energy of both Houses of Congress;
- 5) The evidence of receipt of copies of the Joint Application and its attachments by all those making requests therefor, if any; and
- 6) Such other proofs of compliance with the requirements of the Commission.

Applicant and all interested parties are directed to submit, at least five (5) days before the date of initial hearing and Pre-Trial Conference, their respective Pre-trial Briefs containing, among others:

- a. A summary of admitted facts and proposed stipulation of facts;
- b. The issues to be tried or resolved;
- c. The documents or exhibits to be presented, stating the purposes and proposed markings therefore; and
- d. The number and names of the witnesses, with their written testimonies in an individual affidavit form, to be attached to the Pre-trial Brief.

Failure of Applicant to submit the required Pre-trial Brief and judicial Affidavits of its witnesses within the prescribed period shall be a ground for cancellation of the scheduled hearing, and the resetting of which shall be six (6) months from said date of cancellation.

Applicant must also be prepared to make an expository presentation of its Application, aided by whatever communication medium that it may deem appropriate for the purpose, in order to put in plain words and explain, for the benefit of the consumers and other concerned parties, what the Application is all about and the reasons and justifications being cited in support thereof.

**SO ORDERED.**

Pasig City, 19 June 2017.

FOR AND BY AUTHORITY  
OF THE COMMISSION:



**ALFREDO J. NON**  
*Officer-in-Charge,*  
*Energy Regulatory Commission*

  
KTB/RFM/APV

**Copy furnished:**

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4. **Senate Committee on Energy**  
GSIS Bldg. Roxas Blvd., Pasay City  
Metro Manila
5. **House of Representatives Committee on Energy**  
Batasan Hills, Quezon City, Metro Manila
6. **Office of the President**  
Philippine Chamber of Commerce and Industry (PCCI)  
3rd Floor, Chamber and Industry Plaza (CIP)  
1030 Campus Avenue corner Park Avenue  
McKinley Town Center, Fort Bonifacio, Taguig City
7. **Office of the City Mayor**  
Pasig City
8. **Sannguniang Panglungsod ng Pasig**  
Pasig City
9. **MOS-SMD**  
Energy Regulatory Commission  
12/F Pacific Center, San Miguel Avenue  
Ortigas Center, Pasig City
10. **Manila Electric Company (Intervenor)**  
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