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

IN THE MATTER OF THE APPLICATION FOR THE ISSUANCE OF RULES ON THE PRICE DETERMINATION METHODOLOGY FOR THE IMPLEMENTATION OF THE CO-OPTIMIZED ENERGY AND RESERVE MARKET IN THE WHOLESALE ELECTRICITY SPOT MARKET

ERC CASE NO. 2023-002 RC

PHILIPPINE ELECTRICITY MARKET CORPORATION AND THE INDEPENDENT ELECTRICITY MARKET OPERATOR OF THE PHILIPPINES, INC.,
Applicants.
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Promulgated:
February 10, 2023

NOTICE OF PUBLIC HEARING

TO ALL INTERESTED PARTIES:

Notice is hereby given that on 10 January 2023, Philippine Electricity Market Corporation (PEMC) and Independent Electricity Market Operator of the Philippines, Inc. (IEMOP) filed a *Joint Application* dated 26 October 2022, seeking for the Commission's approval of the issuance of Rules on the Price Determination Methodology (PDM) for the implementation of the co-optimized energy and reserve market in the Wholesale Electricity Spot Market (WESM).

The pertinent portions of the said *Joint Application* are hereunder quoted:

1. This is an Application jointly filed by PEMC and IEMOP for the approval of the amendments to the Price Determination

Methodology (PDM) for the Wholesale Electricity Spot Market ("WESM") to include relevant methodologies and procedures for the trading of reserves or ancillary services in the WESM.

2. It is being submitted in relation to the Decision by this Honorable Commission on 20 August 2020 in the case titled, "*In the Matter of the Application for the Approval of the Price Determination Methodology for the Wholesale Electricity Market,"* docketed as ERC Case No. 2017-042 RC, ("PDM Decision") wherein this Honorable Commission deferred the approval of the reserves-related procedures and methodologies,[1] citing the need to await the promulgation by the Department of Energy (DOE) of a policy relating to ancillary services.[2]

3. Subsequently, the DOE issued a policy framework for the operationalization of the trading of reserves on 13 May 2021 and thereafter directed the review and submission of the necessary proposals for amendments to the WESM Rules and Manuals to implement its policies. After the proposed amendments to various provisions of the WESM Rules and Manuals were submitted to the DOE for approval, the DOE directed herein Applicants to file before this Honorable Commission the Price Determination Methodology (PDM) containing the proposed amendments for the implementation of the co-optimized energy and reserve market.

4. Thus, this Application is being filed in compliance with the directives of the DOE and pursuant to Section 30 of Republic Act No. 9136, otherwise known as the Electric Power Industry Reform Act of 2001 ("EPIRA"), which states in part that:

xxx

> 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 the said rules shall be subject to the approval of the ERC. xxx (emphasis supplied)

AUTHORITY TO FILE THE APPLICATION

5. Applicant PEMC is a non-stock, non-profit private corporation duly organized and existing in accordance with the laws of the Philippines with principal office address at the 18th Floor Robinsons Equitable Tower, ADB Avenue, Ortigas Center, Pasig City. It is represented in this Application by its

[1] PDM Decision, p. 197.
[2] PDM Decision, pp. 247-248.

President, upon whom all orders, notices and communication relative to this Application may be served. The PEMC President has been duly authorized by the Applicant's Board of Directors ("PEM Board") to file this Application jointly with IEMOP and represent the Applicant PEMC in all stages of the proceedings, as evidenced by the Secretary's Certificates hereto attached as Annexes "A" to "A-1".

6. Applicant IEMOP is a non-stock, non-profit private corporation duly organized and existing in accordance with the laws of the Philippines with principal office address at the 9th Floor Robinsons Equitable Tower, ADB Avenue, Ortigas Center, Pasig City. It is represented in this Application by its President and Chief Executive Officer, Atty. Richard J. Nethercott, upon whom all orders, notices and communication relative to this Application may be served. Atty. Nethercott has been duly authorized by the Applicant's Board of Directors ("IEMOP Board") to file this Application jointly with PEMC and represent the Applicant IEMOP in all stages of the proceedings, as evidenced by the Secretary's Certificate hereto attached as Annexes "B" to "B-1".

7. DOE Department Circular No. DC2019-12-0018 titled "Adopting a General Framework Governing the Provision and Utilization of Ancillary Services in the Grid" directs the Market Operator to, among others, secure the approval of the Honorable Commission of the pricing mechanism for reserves traded in the WESM, which pricing mechanism is to be incorporated in the WESM Price Determination Methodology. A copy of DC2019-12-0018 is hereto attached and made an integral part as Annex "C".

8. Beginning 00:00H, 26 September 2018, the IEMOP assumed the performance of the market operations function of the WESM in view of the transition to the Independent Market Operator.

   8.1. The EPIRA and the EPIRA IRR mandate that the WESM shall be implemented by a Market Operator, which shall initially be an autonomous group market operator (AGMO) and, thereafter, the Independent Market Operator (IMO). The AGMO is to be composed of an equitable representation of the electric power industry participants, shall be responsible for the preparations for and initial operations of the WESM and shall be under the administrative supervision of the National Transmission Corporation (TRANSCO).

   8.2. The transition to the Independent Market Operator (the "IMO") is mandated by Section 30 of the EPIRA which mandates that one year after the commercial operations of the Philippine Wholesale Electricity Spot Market (the "WESM') an independent entity shall be formed, which shall assume the functions, assets and liabilities of the market operator. Upon its transition, the AGMO's functions, assets and liabilities shall be

transferred to the IMO upon joint endorsement of the DOE and the electric power industry participants and the administrative supervision of TRANSCO shall cease.

8.3. The DOE endorsed the transition to the Independent Market Operator upon issuance of its Department Circular No. 2018-01-0002 dated 18 January 2018 entitled "Adopting Policies for the Effective and Efficient Transition to the Independent Market Operator for the Wholesale Electricity Spot Market". A copy of DC2018-01-0002 is hereto attached and made an integral part as Annex "D".

8.4. The industry participants likewise endorsed the transition through ratification by the members of PEMC during its membership meeting held on 06 February 2018 of the "Plan for Transition to the Independent Market Operator of the Philippine Wholesale Electricity Spot Market" (IMO Transition Plan). A copy of the IMO Transition Plan is hereto attached and made an integral part as Annex "E".

8.5. IEMOP was thereafter organized as a non-stock, non-profit private corporation that is separate from PEMC. IEMOP was incorporated to become the IMO and as such, shall assume and perform all functions of the Market Operator as set out in the EPIRA, the EPIRA IRR and the WESM Rules, market manuals, and other rules, regulations and issuances.

8.6. On 19 September 2018, the Philippine Electricity Market Operator (PEMC) and IEMOP executed the Operating Agreement by virtue of which, PEMC acknowledges and confirms that IEMOP is the corporation duly incorporated in the Philippines to act as the Independent Market Operator of the WESM pursuant to the IMO Transition Plan and DOE Department Circular No. 2018-01-0002 dated 18 January 2018. A copy of the Operating Agreement is hereto attached and made an integral part as Annex "F".

8.7. The time and date of the actual transfer and assumption by IEMOP of the market operator functions and other services defined in the Operating Agreement was on 00:00H, 26 September 2018. Correspondingly, the related assets, personnel and liabilities were transferred from PEMC to IEMOP as of said date.

8.8. In Department Circular No. 2020-10-0021 dated 22 October 2020 entitled "Adopting Further Amendments to the Wholesale Electricity Spot Market (WESM) Rules", the DOE affirmed the establishment of the Independent Market Operator which shall

administer the operations of the WESM in accordance with the EPIRA, its Implementing Rules and Regulations, the WESM Rules and Market Manuals, and such other relevant laws, rules and regulations. Meanwhile, PEMC was affirmed as the Governance Arm of the WESM and is to perform its mandate as such in accordance with the policies and guidelines for the governance of the WESM contained in the Implementing Rules and Regulations of the EPIRA, WESM Rules and such other relevant laws, rules and regulations. A copy of DC2020-10-0021 is hereto attached and made an integral part as Annex "G".

9. IEMOP is now filing this Application in its capacity as the Market Operator, pursuant to its mandate under DOE Department Circular No. 2021-03-0009 titled "Adopting a General Framework Governing the Operationalization of the Reserve Market in the Wholesale Electricity Spot Market and Providing Further Policies to Supplement DC2019-12-0018", in relation to DOE Department Circular No. DC2019-12-0018, to secure the approval of the Honorable Commission of the pricing mechanism for reserves traded in the WESM, which pricing mechanism is to be incorporated in the WESM Price Determination Methodology.

10. PEMC on the other hand, is filing this Application as the Governance Arm of the WESM, and the original Applicant in the PDM Case docketed as ERC Case No[.] 2017-042 RC which was filed in PEMC's capacity as the then AGMO. Notably, the original Application included provisions pertaining to the pricing and settlement mechanisms for the trading of reserves in the WESM. This was pursuant to Section 3(b) of Department Circular No. DC2015-10-0015 titled, "Providing Policies for Further Enhancement of the Wholesale Electricity Spot Market (WESM) Design and Operations" issued by the DOE, directing 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 hereto attached and made an integral part as Annex "H".

11. Moreover, in its capacity as the Governance Arm of the WESM, PEMC's functions include facilitating the formulation and amendment of the WESM Rules, Retail Rules and Market Manuals through the WESM rules change process[3]. The amendments to the Price Determination Methodology that are the subject of this Application were approved through the said rules change process.

12. In this regard, this Application is also being filed pursuant to Rule 21, Sections 1 and 2 of the ERC Rules of Practice and Procedure which provides:

[3]WESM Rules, Clause 1.4.5.2(e).

> 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.

13. The Price Determination Methodology contains the rules for determining the prices and schedules for dispatch, based on the offers of generation companies and demand of customers, taking into consideration power system conditions or constraints, consistent with a deregulated environment as provided for under Section 6 of the EPIRA, that the generation sector is competitive and open. The Application does not seek to set an electricity rate directly chargeable to end-users, instead the mechanism to result in price outcomes as determined by behavior and system conditions. While the Honorable Commission has already decided on the merits of the energy market, the other half of the process intends to realize the co-optimization of energy and reserves as an essential component in the completion of the wholesale electricity market design.

14. The approved Price Determination Methodology under the Decision dated 20 August 2020 consolidated and amended all prior issuances of the Honorable Commission on pricing and settlements of transactions in the WESM. This Application seeks the approval of the proposed amendments to the previously approved PDM to include provisions pertaining to the trading of reserves or ancillary services in the WESM.

ANCILLARY SERVICES OR RESERVES

15. Section 2 of Republic Act No. 9136, otherwise known as the Electric Power Industry Reform Act of 2001 (“EPIRA”), declared the Policy of the State among others to: (i) ensure the quality, reliability, security and affordability of the supply of electric power; (ii) protect the public interest as it is affected by the rates and services of electric utilities and other providers of electric power; and (iii) establish a strong and purely independent regulatory body and system to ensure consumer protection and enhance the competitive operation of the electricity market.

16. Section 37 of the EPIRA further mandates the DOE to supervise the restructuring of the electricity industry by formulating policies for the planning and implementation of a comprehensive program for the efficient supply and economical use of energy consistent with the approved national economic plan and with the policies on environmental protection and conservation and maintenance

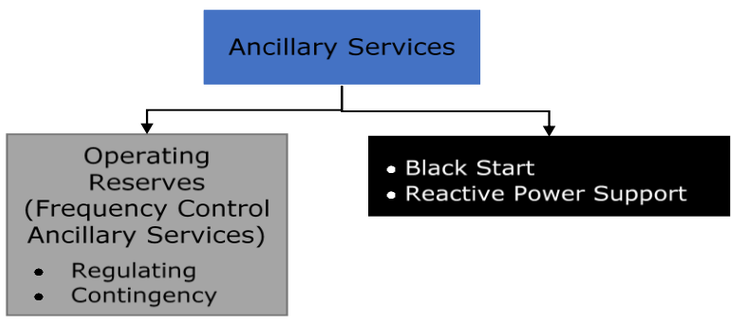
of ecological balance, and provide a mechanism for the integration, rationalization and coordination of the various energy programs of the Government and such rules and regulations as may be necessary to implement the objectives of EPIRA.

17. The EPIRA also defined Ancillary Services as, "services that are necessary to support the transmission of capacity and energy from resources to loads while maintaining reliable operation of the transmission system in accordance with good utility practice and the Grid Code." Relative to this, Clause 3.3.3.2 of the WESM Rules requires the System Operator to provide adequate ancillary services for each region by entering into contracts with Ancillary Services Provider and/or competitive spot market trading.

18. Clause 3.3.4 of the WESM Rules provides for the establishment and administration of a spot market for the purchase of certain reserve categories by the Market Operator, in coordination with the System Operator, when reasonably feasible.

19. Generators are the primary providers of reserves. For a generator to provide reserves to the grid, they must be certified by the System Operator pursuant to the policy of the DOE, which requires the System Operator to test the capabilities of all generators in providing ancillary services[4].

20. Reserves can be largely grouped into two types: (a) for frequency control (operating reserves) and (b) for black-start and reactive support.



21. Frequency Control Ancillary Services or operating reserves are generating capacities scheduled by the System Operator that can provide immediate response to ensure that the balance between generation and load is maintained at all times. The basic types of operating reserves are Regulation, Contingency, and Dispatchable Reserves, each of which perform a distinct role in the delicate balance of supply and demand in the grid.

[4] DC2019-12-0018, Section 3.

POLICY ISSUANCES RELATING TO THE RESERVES MARKET

22. DOE Department Circular Nos. DC2010-06-0007 and 2013-12-0027 provided for the initial guidelines on the preparations for the trading of ancillary services in the WESM. Copies of DOE Department Circular Nos. DC2010-06-0007 and 2013-12-0027 are hereto attached and made integral parts as Annexes "I" and "J", respectively.

23. DOE Department Circular Nos. DC2014-03-0009 and 2014-12-0022 provided for the promulgation of the WESM Manual on the Protocol for Central Scheduling and Dispatch of Energy and Contracted Reserves. The implementation of the central scheduling of reserves and energy mandated had the objectives of monitoring all available generation capacity inclusive of reserves, and to prepare market participants for the eventual commercial operation of the trading of reserves in the WESM. Copies of DOE Department Circular Nos. DC2014-03-0009 and 2014-12-0022 are hereto attached as Annexes "K" and "L", respectively and are hereby made integral parts of this Application.

24. On 23 October 2015, the DOE issued Department Circular No. DC2015-10-0015 adopting certain recommendations of the studies conducted on the enhancements to the WESM design and operations which includes among others, the shortening of the dispatch interval from one (1) hour to five (5) minutes, and implementation of the co-optimization of energy and reserves. A copy of DOE Department Circular No. DC2015-10-0015 is hereto attached and made an integral part as Annex "M".

25. DOE Department Circular No. DC2015-11-0018 declared the commercial operation of the central scheduling and dispatch of energy and contracted reserves in the WESM and provided further amendments to the previously approved protocol. This was to be in preparation for the eventual operation of the trading of reserves in the WESM. A copy of DOE Department Circular No. DC2015-11-0018 is hereto attached and made an integral part as Annex "N".

26. On 04 December 2019, the DOE issued Department Circular No. DC2019-12-0018 which contains a general policy framework governing the provision and utilization of ancillary services in the grid in order, among other purposes, to harmonize ancillary service-related issuances and address various issues. It also set out the requirements for the commercial operations of the co-optimized energy and trading of reserves, and set out that such commercial operations is subject to the compliance with the readiness criteria for the commercial operation of the Trading of Reserves in the WESM, among others. It also created the Ancillary Services-Technical Working Group (AS-TWG) to render technical assistance to the DOE in developing further policies, among other responsibilities, which may include the co-optimized market design. A copy of DOE DC2019-12-0018

dated 04 December 2019 is hereto attached and made an integral part as Annex "O".

27. The AS-TWG, through AS-TWG Resolution No. 2020-01, provided "Recommendations to the DOE and Energy Regulatory Commission (ERC) on Further Implementation of DOE Department Circular No. DC2019-12-0018". A copy of AS-TWG Resolution No. 2020-01 is hereto attached and made integral part as Annex "P".

28. On 29 December 2020, the Energy Regulatory Commission (ERC) promulgated its Decision on the Application filed by herein Applicant PEMC, on the DOE-approved[5] Price Determination Methodology (PDM) containing provisions on reserve pricing and settlement for the enhanced WESM design and operations[6].

29. In the Decision, the ERC ordered that reserve related features of the PDM shall be subject to the DOE's pending policy issuance on ancillary services, which deferred the provisions on reserve pricing and settlement.

30. Subsequently, on 13 May 2021, the DOE issued a policy framework for the operationalization of the trading of reserves and in addition to its existing responsibilities relative to the trading of reserves, tasked the Market Operator to review and submit to the WESM Rules Change Committee proposed amendments to the WESM Rules and Manuals to incorporate the policies provided in DOE Department Circular DC2021-03-0009 dated 27 March 2021, which supplemented the earlier DOE policy and provided the features of the trading of reserves. A copy of DOE DC2021-03-0009 dated 27 March 2021 is hereto attached and marked as Annex "Q".

31. On 06 September 2021, herein Applicant IEMOP submitted their proposal for general amendments to the Rules Change Committee in compliance with the declared policy of the DOE on the implementation of the trading of reserves, with part of the proposal reverting to the reserve pricing and settlement provisions that were previously approved by the DOE. The summary of the proposal is as follows:

Document	Proposed Changes
1. WESM Rules	• Align definition of reserve categories with DOE DC2021-03-0009 • Specify information required for registration of Ancillary Service Providers • Inclusion of reserve settlement quantities and amounts • Removal of spot reserve recovery charges from Trading Participants' settlement

[5] DOE DC 2017-03-0001 dated 20 March 2017.
[6] ERC Case No. 2017-042 RC.

Document	Proposed Changes
	amounts in view of the NGCP being designated as the single buyer for reserves • Designation of the System Operator as single buyer for reserves
2. WESM Manual on Price Determination Methodology, Issue 3.0	• Definition of reserve regions as Luzon, Visayas and Mindanao • Inclusion of details on optimization constraints, including but not limited to scheduling of multiple reserve categories simultaneously • Automatic pricing rerun parameters for reserve-related constraints, including resulting reserve prices • Price Substitution Methodology to be applied in determining substitute reserve prices in cases of extreme nodal price separation brought about by a network congestion • Determination of Reserve Administered Prices • Definition of reserve quantities and trading amounts • Inclusion of reserve trading amounts in the aggregate trading amounts • Determination of the reserve settlement amounts of the System Operator as single buyer for reserves
3. WESM Manual on Registration, Suspension and De-registration Criteria and Procedures, Issue 10.0	• Designation of the System Operator as Customer Trading Participant with respect to purchase of reserves • Specify information required for registration of Ancillary Service Providers including reserve categories and maximum reserve capability
4. WESM Manual on Billing and Settlement, Issue 8.0	• Calculation of the reserve settlement amounts of the System Operator as single buyer for reserves traded in the WESM • Amendment to the formula of computing projected settlement amount to consider reserve transactions by the System Operator • Issuance of separate settlement statements for reserves
5. WESM Manual on Dispatch Protocol, Issue 16.0	• Guidelines and procedures on the scheduling and dispatch of reserves traded in the WESM • Changes on the guidelines and procedures for submission of reserve offers to include modes of operation • Inclusion of reserve effectiveness factors that will serve as reserve conformance standards applicable to reserve providers

32. On 22 November 2021, the Rules Change Committee issued Resolution No. 2021-21 approving the Proposed Amendments to the WESM Rules and Various WESM Manuals on Implementation of Reserve Market and endorsed the same to the PEM Board for approval and submission to DOE for consideration. Attached hereto and marked as Annex "R" is a copy of RCC Resolution No. 21-21 sans annexes.

33. On 24 November 2021, the PEM Board issued PEM Board Resolution No. 2021-42-08 approving the Proposed Amendments to WESM Rules and Various WESM Manuals on the Implementation of the Reserve Market (RCC Resolution No. 2021-21) as presented by the Rules Change Committee. The PEM Board then endorsed the Proposed Amendments to the DOE on 04 December 2021. A copy of the letter endorsing the proposal to the DOE dated 04 December 2021 is hereto attached as Annex "S".

34. In a letter dated 03 February 2022 addressed to herein Applicant PEMC through its President, the DOE noted the emphasis made by the Market Operator that the regulatory approval on the Price Determination Methodology ("PDM") will prompt the subsequent requisite activities needed to enable the commercial operations of the trading of reserves such as the development, testing, and audit of the market system enhancements. In this regard, the DOE directed herein Applicants to file before this Honorable Commission the PDM containing the proposed amendments for the implementation of the co-optimized energy and trading of reserves. Attached hereto and marked as Annex "T" is a copy of the DOE Letter dated 03 February 2022.

35. On 22 February 2022, the Market Readiness Steering Committee (MRSC) had a meeting with the System Operator who raised some clarifications on operational issues that may possibly arise as an impact of the filing of the PDM Application. Subsequently, from March to May 2022, several coordination meetings were held with representatives of the Department of Energy (DOE) and this Honorable Commission including herein Applicants PEMC and IEMOP, to clarify the procedures and requirements of the filing of this instant Application and to discuss the issues raised by the System Operator. Finally, on 18 May 2022, the DOE issued a letter formally responding to the concerns raised by the System Operator, after maintaining its policy under DOE DC 2021-003-0009.

36. After several consultations with the relevant authorities and stakeholders, this instant Application is now being filed before this Honorable Commission for the approval of the PDM that will govern the implementation of a co-optimized energy reserves market, pursuant to the directives of the DOE. Once approved, the DOE will cause the promulgation of the amendments to the PDM Manual.

AMENDMENTS TO THE PDM TO COVER METHODOLOGIES ON TRADING OF RESERVES

37. Under Department Circular No. DC2021-03-0009, the implementation of the trading of reserves in the WESM shall adhere to the following principles:

    a) The continuing development and operationalization of the trading of reserves shall take into account key policies stipulated in the DOE Roadmap, which include among other initiatives, Renewable Energy Market, Electricity Derivatives Market, Demand-Side Bidding, and exploratory studies on Capacity Market, as applicable;

    b) The WESM shall provide the optimal solution for all available capacities when scheduling reserve and energy capacities through co-optimization while adhering to grid reliability requirements;

    c) The System Operator (SO) and the Market Operator (MO) shall allow for non-discriminatory participation of all capable Ancillary Service Providers (ASPs), including demand-side resources, in various reserve categories, provided that all participants shall comply with the certification of AS capability issued by the SO or any qualified third-party AS testing entity duly accredited by the ERC;

    d) A single buyer system shall be implemented for the procurement of AS requirements whether sourced through the WESM or AS Procurement Agreements (ASPA)s;

    e) Recovery of reserves costs among grid users shall be implemented in accordance with the guidelines on AS cost-recovery to be promulgated by the ERC;

    f) Sufficiency of reserves in the Grid shall be ensured through procurement of reserves through ASPAs and the WESM; and

    g) For purposes of simplification, all references to WESM in this Circular shall mean the co-optimized energy and trading of reserves.[7]

38. 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. It also includes the methodology for 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.

[7] Department Circular No. DC2021-03-0009, Section 1.

39. In addition to providing the details for determining prices and schedules, the price determination methodology also provides the details for calculating settlement amounts for transactions net of bilateral contracts in accordance with Section 3.13 of the WESM Rules.

40. In compliance with the directive of the Honorable Commission in the PDM Decision, Applicant PEMC submitted the Price Determination Methodology document which embodies the procedures and methodologies approved under the PDM Decision for determining prices and settlements in the WESM.

41. Subsequently, this submitted document was issued as the WESM Manual on Price Determination Methodology which became effective on 26 June 2021 upon the commencement of the commercial operations of the Enhanced WESM Design and Operations (EWDO).

42. The instant Application submits the proposed amendments to the WESM Manual on Price Determination Methodology for the approval of the Honorable Commission to cover the trading of reserves in the WESM and fully implement a co-optimized energy and reserves market. The following sections discuss the highlights of the proposed amendments which is contained in the Proposed Amended PDM, a copy of which is hereto attached and made an integral part as Annexes "U" and "U-1," respectively.

A. *Inclusion of reserve pricing and settlement in the Scope of the PDM Manual*

43. The scope of the WESM Manual on Price Determination Methodology ("PDM Manual") currently includes the methodology by which energy shall be priced and settled in accordance with the market design principles as issued by the DOE; including the determination of prices when there is extreme price separation due to network congestion, determination of administered prices during market suspension and market intervention; additional compensation, as applicable; the determination and allocation of net settlement surplus; and computational formula that will enable the WESM participants to verify the correctness of the charges being imposed.[8]

44. WESM Rules Clause 3.10.5 (a) already provides the definition for determining reserve prices, where the reserve price for a reserve category in a particular reserve zone for each dispatch interval shall be determined as the shadow price on the relevant reserve requirement constraint, defined in accordance with WESM Rules Clause 3.6.1.4 (e), in the dispatch optimization for that dispatch interval and published

[8] Section 1.3 of the WESM Manual.

by the Market Operator before the start of that dispatch interval. This was similarly reflected in the proposal (New Section 4.11.3 of the Proposed Amended PDM).

45. The PDM's objective function already provides the mechanism for the co-optimized scheduling of energy and reserves in the MDOM. The proposal specifies the domain of the co-optimization, which is for each reserve category in each reserve region (Proposed revision to Section 1.3, new Sections 4.11.1, 4.11.3 and 4.12.1 of the Proposed Amended PDM). An illustrative example on the co-optimization of energy and reserve is proposed to be included in the PDM Manual as Appendix F. A copy of the proposed Appendix F to the PDM Manual is hereto attached and marked as Annex "V".

B. *Definition of Luzon, Visayas and Mindanao as Reserve Regions*

46. The reserve regions shall initially consist of the Luzon, Visayas, and Mindanao Grids, reflecting the System Operator's current practice that reserve requirements are set for each grid (Section 4.11.2 of the Proposed Amended PDM). Visayas is proposed to be treated as a single reserve region since dividing it into multiple reserve zones corresponding to the different combinations related to its electrical islanding operations in the region will result to higher reserve requirements and accordingly, higher reserve costs as compared to treating it as a single reserve region.

C. *Application of WESM Prices*

47. The current PDM Manual particularly in Section 4.12.1 states that in general, the nodal prices resulting from the *real-time dispatch market run* as determined in Section 4.4.4, and, as applicable, Section 4.4.5, shall be used as *final nodal energy prices* in the calculation of *settlements* except if there are non-zero constraint violation variable values:

a) If there are one or more non-zero *constraint violation variable* values, then *automatic pricing re-run* prices in accordance with Section 5.2 shall apply; and

b) If there are pricing errors, prices from market pricing re-runs under Section 5.3 shall apply.

48. The proposal merely seeks to add reserve prices to the provision in such a way that the nodal prices resulting from the real-time dispatch market run shall now also be used as reserve prices in the calculation of settlements, with the same exceptions on the occurrence of non-zero constraint violation variable values or Pricing Error Notices (PEN). The PEN is for manual pricing correction only.

D. *Automatic Pricing Reruns*

49. Automatic pricing reruns for market projections and real-time dispatch shall ensure that the energy prices reflect the marginal costs of supplying energy at each node, regional, or island level.[9] The proposal seeks to include reserves as part of the considerations in automatic pricing reruns such that automatic pricing reruns for market projections and the real-time dispatch shall ensure that both the energy prices and reserve prices reflect the marginal costs of supplying energy at each node, regional, or island level; and the marginal costs of supplying reserves.

50. Settlement-ready reserve prices are also sought to be generated from the MDOM where the *automatic pricing re-run* of the *MDOM* shall determine the prices for *energy* and *reserve* with relaxed *constraints* in cases where constraint violations are experienced, while having approximately the same *energy and reserve schedules* (Sections 5.2.1, 5.2.2 and 5.2.5 of the Proposed Amended PDM).

51. In line with this, the proposal seeks to revise the following table which shows each type of *constraints* with their corresponding *constraint* relaxation formulas during automatic pricing re-runs, to include reserve as part of the re-run price:

Table 1. Pricing Re-runs

Soft Constraint	Violation	Constraint Relaxation during Pricing Re-Run	Re-run Price[2]
Thermal Base Case	X	x + delta	EDP and RP
Transmission Group	X	x + delta	EDP and RP
Self-Scheduled Generation *Constraint*	X	x + delta	EDP and RP
System Energy Balance (Over-generation and under-generation)	X	x + delta	EDP and RP
Nodal Value of Lost Load or Nodal Energy Balance	X	x + delta	EDP and RP
Thermal Contingency	X	x + delta	EDP and RP
Reserve Requirement	X	x + delta	EDP and RP

[9] 5.2.1. of the PDM Manual.

E. *Price Substitution Methodology for Reserves*

52. In cases where the price substitution methodology is applied during congestion, the reserve price for a certain reserve category in a reserve region shall be calculated as the sum of the constrained solution's marginal reserve offer price and the opportunity cost calculated based on the unconstrained solution. It shall be determined as the shadow price calculated based on the unconstrained solution. Price substitution methodology is applied to mitigate the transfer of extreme nodal price separation to the reserve prices.

F. *Administered Prices for Reserves*

53. Under 7.1.2 of the current PDM Manual, the Market Operator is required to establish the administered price in accordance with certain guiding principles. The proposal merely seeks to include reserves in the determination of administered prices.

54. Specifically, administered prices, which shall be determined and shall replace market prices for energy, shall also be made to apply to reserves, such that reserve administered prices shall replace the reserve prices (Section 7.1.2 of the Proposed Amended PDM).

55. The reserve administered price shall similarly be computed based on the similar mechanism on how Administered Prices for Energy is determined (Section 7.1.2 and 7.4 of the Proposed Amended PDM). The market resource is generalized to consider loads acting as reserve providers. Reserve administered prices are to be computed per reserve region and applied to each reserve provider resource belonging to a reserve region (Section 7.4 of the Proposed Amended PDM).

56. Historical reserve dispatch schedules are used instead of snapshot quantities (Section 7.4 of the Proposed Amended PDM). In case two (2) or more of the four (4) most recent similar *trading days* and similar *dispatch intervals* have not been administered, the *reserve administered price* for each *reserve category* in every *reserve region* shall be computed as follows:

    a. The aggregate *reserve dispatch schedule*-weighted average of the *reserve prices* for each *reserve category* in every *reserve region* of the four (4) most recent similar *trading days* and similar *dispatch intervals* that have not been administered, as set out in the following formula:

$$RAP_{r,a,D,i} = \frac{\sum_{d=D-1}^{D-n}\left(RP_{r,a,d,i} * \sum_{k \epsilon K_{r,a,d,i}} RDS_{k,r,a,d,i}\right)}{\sum_{d=D-1}^{D-n}\sum_{k \epsilon K_{r,a,d,i}} RDS_{k,r,a,d,i}}$$

Where:

$RAP_{r,a,D,i}$	refers to the *reserve administered price* for *reserve category r in reserve region a* at *dispatch interval i* within *trading day D*
$RP_{r,a,d,i}$	refers to the *reserve price* for *reserve category r* in *reserve region a* at *dispatch interval i* within *trading* day *d*
$RDS_{k,r,a,d,i}$	refers to the *reserve dispatch schedule* for *reserve provider* resource *k* for *reserve category r* in *reserve region a* at *dispatch interval i* within *trading day d*
D	refers to the *trading day* with *dispatch interval* under *market intervention* or *market suspension*
$d = D - n$	refers to the n^{th} most recent non-administered similar *trading day* and similar *dispatch interval*
n	refers to the number of similar *trading days* and *dispatch intervals* that have not been administered from the four (4) most recent similar *trading days* and *dispatch intervals*

57. In case three (3) or all of the four (4) most recent similar *trading days* and similar *dispatch intervals* have been administered, the *reserve administered price* for each *reserve category* in every *reserve region* shall be computed as follows:

    a. *The aggregate reserve dispatch schedule*-weighted average of the *reserve administered prices* of the similar *trading days* and similar *dispatch intervals* as set out in the following formula:

$$RAP_{k,D,i} = \frac{\sum_{d=D-1}^{D-n}\left(RAP_{k,d,i} * \sum_{k \epsilon K_{r,a,d,i}} RDS_{k,r,a,d,i}\right)}{\sum_{k \epsilon K_{r,a,d,i}} RDS_{k,r,a,d,i}}$$

Where:

$RAP_{k,D,i}$	refers to the *reserve administered price* for *reserve provider* resource *k* at *dispatch interval i* within *trading day D*

$RAP_{k,d,i}$	refers to the *reserve administered price* for *reserve provider* resource *k* for *dispatch interval i* within *trading day d*
$RDS_{k,r,a,d,i}$	refers to the *reserve dispatch schedule* for *reserve provider* resource *k* for *reserve category r* in *reserve region a* at *dispatch interval i* within *trading day d*
D	refers to the current *trading day*
$d = D - n$	refers to the n^{th} most recent similar *trading day* of *D*
n	refers to the number of similar *trading days* and *dispatch intervals* that have not been administered from the four (4) most recent similar *trading days* and *dispatch intervals*

58. For each reserve provider resource, the reserve dispatch schedule shall be set to the reserve schedules determined by the System Operator for the dispatch interval under market suspension or market intervention.

59. Similar trading days refer to each day of the week (i.e., Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday) while similar dispatch intervals refer to the same period within the same settlement interval.

60. The capacities that were nominated as reserves by the System Operator shall be used for settlements (Section 7.4.3 of the Proposed Amended PDM). For this purpose, the System Operator shall be required to provide this information to the Market Operator for purposes of settlement and in accordance with the WESM billing and settlement timeline.

G. Reserve Trading Amount[10]

61. Mathematical details are proposed to be included to determine how the reserve quantity and reserve trading amounts are computed (Section 8.2.2 of the Proposed Amended PDM), to wit:

    a) the *reserve quantity* for any *reserve provider* resource in any *dispatch interval* shall be determined by the *Market Operator* as the *reserve dispatch schedule* less *reserve* contracted quantities, as shown in the following formula (Section 8.2.2 of the Proposed Amended PDM):

$$RQ_{j,\,r,\,a,\,I} = \left(RDS_{j,\,r,\,a,\,i} - RBCQ_{j,\,r,\,a,\,i}\right)$$

[10] *WESM Rules Clause* 3.13.

Where:

$RQ_{j, r, a, i}$ refers to the *reserve quantity* of *reserve provider* resource *j* for *reserve category r* and *reserve region a* at *dispatch interval i*

$RDS_{j, r, a, i}$ refers to the *reserve dispatch schedule* of *reserve provider* resource *j* for *reserve category r* and *reserve region a* at *dispatch interval i*

$RBCQ_{j, r, a, i}$ refers to the *bilateral contract quantity* for *reserve provider* resource *j* for *reserve category r* and *reserve region a* at *dispatch interval i*

b) The *reserve trading amount* for each t*rading participant* that supplies reserve to a particular *reserve region* in a *settlement interval* shall be determined as the *reserve prices* for that *reserve region* multiplied by the *reserve quantities* for that *trading participant* in that *reserve region* for the *dispatch intervals* of the relevant *settlement interval.*

$$\text{RTA}_{\text{p, r, a, h}} = \sum_{i \in h} \left[\frac{1}{n} \sum_{j \in Jp} \left(RP_{r,a,i} * RQ_{j,r,a,i} \right) \right]$$

Where:

$RTA_{p, r, a, h}$ refers to the *reserve trading amount* of *trading participant p* for *reserve category r* and *reserve region a* at *settlement interval h*

$RP_{r, a, i}$ refers to the *reserve price* for reserve category *r* and reserve region *a* at dispatch interval *i* in settlement interval *h*

$\text{RQ}_{j, r, a, i}$ refers to the reserve quantity of *reserve provider* resource *j* for reserve category *r* and reserve region a at dispatch interval *i* in settlement interval *h*

J_p refers to the set of *reserve provider* resources under *trading participant p*

n refers to the number of dispatch intervals within a settlement interval, which is 12 for a five-minute market

H. Reserve Cost Recovery Amount

62. As prescribed in the Single Buyer System in DOE DC 2021-03-0009 Section 1.4, the reserve cost shall be recovered from the System Operator.

63. The *reserve cost recovery amount* for every reserve category and reserve region shall be determined as the negative of the aggregate sum of the *reserve trading amounts* of the *trading participants* who supplied for that *reserve category* and *reserve region* (Section 8.2.3 of the Proposed Amended PDM)*, using the formula represented as:*

$$\text{RRCost}_{r,\,a,\,h} = (-1) \sum_{p \in P} \text{RTA}_{p,\,r,\,a,\,h}$$

Where:

$RRCost_{r,\,a,\,h}$	refers to the *reserve cost* for reserve category *r* in *reserve region a* at settlement interval *h*
$\text{RTA}_{p,\,r,\,a,\,h}$	refers to the *reserve trading amount* of *trading participant p* for *reserve category r* and *reserve region a* at *settlement interval h*
P	refers to the set of *trading participants*

$$\text{RRCost}_{r,\,a,\,h} = (-1) \sum_{p \in P} \text{RTA}_{p,\,r,\,a,\,h}$$

Where:

$RRCost_{r,\,a,\,h}$	refers to the *reserve cost* for reserve category *r* in *reserve region a* at settlement interval *h*
$\text{RTA}_{p,\,r,\,a,\,h}$	refers to the *reserve trading amount* of *trading participant p* for *reserve category r* and *reserve region a* at *settlement interval h*
P	refers to the set of *trading participants*

I. Aggregate Trading Amount

64. In the calculation of trading amounts, reserve trading amounts are added such that the aggregate *trading amount* for a *Trading Participant* for a *settlement interval* shall now be determined not only by using *Energy trading amounts,* which may be positive or negative for any *Trading Participant but also Reserve Trading Amounts* (Sections 8.2.4 and 8.4.3 of the Proposed Amended PDM). This is provided in the following formula:

$$\text{TA}_{p,h} = \text{ETA}_{p,h} + \text{RTA}_{p,h}$$

Where:

$TA_{p,h}$	refers to the aggregate *trading amount* of *trading participant p* for *settlement interval h*
$ETA_{p,h}$	refers to the *energy trading amount* of *trading participant p* at *settlement interval h*

$RTA_{p,h}$	refers to the *reserve trading amount* of *trading participant p* at *settlement interval h*

J. Settlement Amounts

65. A provision to calculate the Settlement Amounts for the System Operator is required, hence, it is proposed that for each *billing period*, the *Market Operator* shall determine the *settlement amount* for the *System Operator* as the sum of the aggregate *reserve recovery amounts* for the *settlement intervals* in that *billing period* (Section 8.4.3 of the Proposed Amended PDM). This is provided in the following formula:

$$SA_{so,r,a,m} = \sum_{h \in H_m} \sum_{a \in A} \sum_{r \in R} RRCost_{r,\,a,\,h}$$

Where:

$SA_{,,so,m}$	refers to the *settlement amount* of the *System Operator* for *billing period m*
$RRCost_{r,\,a,\,h}$	refers to the *reserve cost* for reserve category *r* in *reserve region a* at settlement interval *h*
H_m	refers to the settlement interval under billing period m
R	refers to the set of *reserve categories*
A	refers to the set of *reserve regions*

K. Reserve Requirements

66. For reserve requirements, Dispatchable Reserves are sought to be included as a type of Contingency Reserves while retaining the same formula (Appendix A Section 2.2 of the Proposed Amended PDM), thus:

> Analogously to Regulating Reserve Raise and Regulating Reserve Lower requirements, the minimum regional reserve requirements can be specified for other ancillary services (AS) and for each time interval:

$$\underline{Res}^{t}_{ASreq} \leq \sum_{unit \in AS} Res^{t}_{unit}$$

L. Generating / Load Resource Constraints

67. In compliance with Section 3.1.1.3 of DC2021-03-0009, constraints on simultaneous provisions of reserve are added on the core parts of the Reserve model (Appendix A, Section 4.3.1. of the Proposed Amended PDM).

68. Contingency and dispatchable reserves are likewise specified in the provision which discussed Resource Reserve Capacity Limits under Section 4.3.2 in the PDM Manual.

M. *Constraints on Simultaneous Provision of Reserve*

69. In compliance with Section 3.1.1.3 of DC2021-03-0009, constraints on simultaneous provisions of reserve are added on the core parts of the Reserve model under Appendix A, Section 4.3.1. of the Proposed Amended PDM.

70. Further, in the proposed Section 4.3.7 in Appendix A of the Proposed Amended PDM, the constraints on scheduling of reserves, including the simultaneous provision of reserves, are hereby enumerated as follows:

a) Limitations on the provision of *reserve* awards are also considered in the *MDOM*.

b) If it is defined in the MDOM where regulation and contingency reserve schedules cannot be awarded at the same time for a resource, then the MDOM will choose the most optimal reserve category the resource should be scheduled at, in consideration of the optimization objective defined in the MDOM.

c) Different ramping constraints when operating in different modes of operation (e.g., automatic generation control, governor control mode).

N. *Reserve Conformance Standards*

71. The Market Operator shall develop reserve conformance standards to be set forth in the relevant Market Manual which shall be consistent with the Philippine Grid Code and Philippine Distribution Code.[11]

TWO-PHASE IMPLEMENTATION OF THE INTEGRATION OF RESERVES IN THE WESM

72. On February 2022, the Honorable Commission published for comments the draft Ancillary Services Rules (AS Rules) under ERC Case Nos. 2017-005 RM and 2018-005 RM. The AS Rules include the transition to new types of reserves as follows: (i) Primary Reserve Ancillary Service, (ii) Secondary Reserve Ancillary Service; and (iii) Tertiary Reserve Ancillary Service.

73. Pursuant to DOE Department Circular No. DC2019-12-0018, the Ancillary Service-Technical Working Group (AS-TWG) was formed, which was co-chaired by Mr. Redentor E. Delola, Assistant Secretary of the DOE and Mr. Nestor V. Padilla, Supervising Energy Regulation Officer of the Honorable

[11] Proposed Clause 3.8.7 of the WESM Rules.

Commission. The AS-TWG conducted a series of discussions through its sub-groups to formulate recommendations to the DOE and the Honorable Commission to be considered in the formulation of the appropriate policies and regulations in line with their respective mandates under the EPIRA. These recommendations are contained in AS-TWG Resolution No. 2020-01 dated 28 October 2020.

74. Among the recommendations in the said Resolution is a two-phase implementation of the integration of the trading of reserves in the WESM:

a. Phase 1 shall represent the initial implementation for at most the first five years, or until the declaration of readiness to implement Phase 2, which will consider the current reserve categories in the Philippines, i.e., Contingency Reserve, Regulating Reserve, Dispatchable Reserve; and

b. Phase 2 shall represent the Enhanced Design in consideration of the principles of the Philippine Grid Code 2016, which requires the formulation of a transition plan with specific timelines on the required actions and compliances from the industry participants in order to move forward and implement the new AS categories (i.e., Primary Reserve, Secondary Reserve, Tertiary Reserve) in accordance with the 2016 Philippine Grid Code, including the preparation of detailed protocols for the participation of load resources and Embedded Generators as AS providers. Except for Secondary Reserve, sub-categories (i.e., raise and lower services) and the fulfillment of primary response will be introduced upon complete transition to the new AS categories.

75. It is respectfully prayed that the Honorable Commission consider the recommendation of the AS-TWG on the two-phase implementation of the integration of reserves in the WESM in the approval of the AS Rules and its implementation, particularly on the retention of the current AS categories for Phase 1 or the initial implementation.

76. Finally, the Applicants pray for the immediate approval of the instant Application as the immediate implementation of the co-optimized energy and reserves in the marker will increase competition in the generation sector and ensure system least cost between energy and reserves, thereby enhancing the environment for more competitive pricing or reasonable rates. It will also ensure compliance with the required ancillary service levels for a more reliable power grid. Thus, the immediate approval of this instant Application will allow the immediate realization of the foregoing benefits.

77. To further support the allegations in the instant Application, attached hereto and marked as Annex “W” is the Affidavit of

the witness, Mr. Isidro E. Cacho Jr., Head of Corporate Strategy and Communications Department of IEMOP.

PRAYER

Wherefore, premises considered, it is respectfully prayed that this Joint Application with the Amended Price Determination Methodology hereby presented be APPROVED, and a corresponding resolution be issued ADOPTING the same.

Other reliefs, just and equitable under the premises, are likewise prayed for.

The Commission sets the instant *Joint Application* for determination of compliance with the jurisdictional requirements, expository presentation, Pre-trial Conference, and presentation of evidence on the following dates and venues:

Date	Platform	Activity
07 March 2023 (Tuesday) at two o'clock in the afternoon (2:00 P.M.)	**Energy Regulatory Commission, Hearing Room, 11th Floor, Exquadra Tower, 1 Jade Drive, Ortigas Center, Brgy. San Antonio, Pasig City**	Determination of compliance with jurisdictional requirements, and Expository Presentation for Luzon Stakeholders
16 March 2023 (Thursday) at two o'clock in the afternoon (2:00 P.M.)	**Energy Regulatory Commission, Visayas Area Operations Division (VAOD), 7th Floor, Kepwealth Building, Samar Loop, Cebu Business Park**	Expository Presentation for Visayas Stakeholders
23 March 2023 (Thursday) at two o'clock in the afternoon (2:00 P.M.)	**Energy Regulatory Commission, Mindanao Area Operations Division (MAOD), 6th Floor, BIZ Bldg., c/o BORMAHECO, INC., 209 J.P. Laurel Avenue, Bajada, Davao City**	Expository Presentation for Mindanao Stakeholders
11 April 2023 (Tuesday) at two o'clock in the afternoon (2:00 P.M.)	**Energy Regulatory Commission, Hearing Room, 11th Floor, Exquadra Tower, 1 Jade Drive, Ortigas Center,**	Pre-Trial Conference and Presentation of Evidence

Date	Platform	Activity
18 April 2023 (Tuesday) at two o'clock in the afternoon (2:00 P.M.)	**Brgy. San Antonio, Pasig City**	Presentation of Evidence
25 April 2023 (Tuesday) at two o'clock in the afternoon (2:00 P.M.)		Presentation of Evidence

Any interested stakeholder may submit its **comments and/or clarifications** at least one (1) calendar day prior to the scheduled initial hearing, via electronic mail (e-mail) at docket@erc.ph, copy furnish the Legal Service through legal@erc.ph. The Commission shall give priority to the stakeholders who have duly submitted their respective comments and/or clarifications, to discuss the same and propound questions during the course of the expository presentation.

Moreover, any person who has an interest in the subject matter of the instant case may become a party by filing with the Commission via e-mail at docket@erc.ph, copy furnish the Legal Service through legal@erc.ph, a verified **Petition to Intervene** at least five (5) calendar days prior to the date of the initial hearing and subject to the requirements under Rule 9 of the ERC Revised Rules of Practice and Procedure, indicating therein the docket number and title of the case and stating the following:

1) The petitioner's name, mailing address, and e-mail address;

2) The nature of petitioner's interest in the subject matter of the proceeding and the way and manner in which such interest is affected by the issues involved in the proceeding; and

3) A statement of the relief desired.

Likewise, all other persons who may want their views known to the Commission with respect to the subject matter of the case may file through e-mail at docket@erc.ph, copy furnish the Legal Service through legal@erc.ph, their **Opposition or Comment** at least five (5) calendar days prior to the initial hearing and subject to the

requirements under Rule 9 of the ERC Revised Rules of Practice and Procedure. No particular form of Opposition or Comment is required, but the document, letter, or writing should contain the following:

1) The name, mailing address, and e-mail address of such person;

2) A concise statement of the Opposition or Comment; and

3) The grounds relied upon.

All interested parties filing their Petition to Intervene, Opposition or Comment are required to submit the hard/printed copy/ies thereof either through personal service, registered or ordinary mail or private courier, within five (5) working days from the date that the same were electronically submitted, as reflected in the acknowledgment receipt e-mail sent by the Commission.

Any of the persons mentioned in the preceding paragraphs may access the copy of the *Joint Application* on the Commission's official website at www.erc.gov.ph.

WITNESS, the Honorable Chairperson and CEO **MONALISA C. DIMALANTA**, and the Honorable Commissioners **ALEXIS M. LUMBATAN, CATHERINE P. MACEDA,** and **MARKO ROMEO L. FUENTES,** Energy Regulatory Commission, this 10th day of February 2023 in Pasig City.

FLORESINDA G. BALDO-DIGAL
Commissioner

LS: MVM/ LSP/MCCG