



TERMS OF REFERENCE

for the Conduct of the Market Design and Operations
Review

26 June 2021 – 25 Dec 2023

Philippine Electricity Market Corporation

June 2023

Table of Contents

| | |
|--|-----------|
| 1. REQUIREMENT | 1 |
| 2. BACKGROUND | 1 |
| 2.1. The WESM | 1 |
| 2.2. Enhanced WESM Design and Operations (EWDO) | 2 |
| 2.3. Basis for the Conduct of Enhanced WESM Design and Operations Implementation Review | 5 |
| 2.4. The Day-Ahead Market | 6 |
| 2.5. Basis for the Conduct of Feasibility Study on the Day-Ahead Market (DAM) | 7 |
| 3. OBJECTIVE OF THE PROJECT | 8 |
| 4. PROJECT SCOPE | 8 |
| 4.1. Period Covered | 8 |
| 4.2. Applicable Rules | 8 |
| 4.3. Scope of Work | 9 |
| 5. PROPOSED ARRANGEMENTS | 11 |
| 5.1. Project Schedule | 11 |
| 5.2. Deliverables | 13 |
| 5.3. Qualifications of Consultants | 13 |
| 5.4. Interface between the Consultants and PEMC | 13 |
| 5.5. Confidentiality | 14 |
| 5.6. Bidder's Obligations | 15 |
| 5.7. Data Privacy | 15 |
| ANNEX A – Rules Amendments for the Implementation of the Enhanced WESM Design and Operations | 17 |

1. REQUIREMENT

Engagement of the services of a third-party consultant to conduct the following studies:

1. Enhanced WESM Design and Operations Implementation Review; and
2. Feasibility Study on the Implementation of Day-ahead Market.

2. BACKGROUND

2.1. The WESM

- 2.1.1. The Electric Power Industry Reform Act of 2001 (EPIRA) mandates the establishment of the Wholesale Electricity Spot Market (WESM) that will facilitate a competitive market environment in the Philippine electricity industry. Pursuant to the EPIRA, the Department of Energy (DOE) and the electric power industry participants are mandated to jointly formulate the detailed rules governing the operations of the WESM. On 28 June 2002, the DOE, upon the joint endorsement of the electric power industry participants, promulgated the WESM Rules through DOE Department Circular No. 2002-06-003.
- 2.1.2. Section 30 of the EPIRA provides, among others, that the DOE shall constitute an autonomous group, with equitable representation from electric power industry participants, to act as the Market Operator. On November 2003, the DOE constituted the Philippine Electricity Market Corporation (PEMC), a non-stock and non-profit organization, to operate the WESM. After several months of trial operations, the WESM commercial operations commenced in Luzon on 26 June 2006. Four years into the commercial operations in Luzon, the Visayas grid was integrated into the WESM and commenced commercial operations on 26 December 2010.
- 2.1.3. On 18 January 2018, the DOE issued Department Circular No. 2018-1-0002 which endorses and sets out the guidelines on the transition to an independent market operator. The Independent Electricity Market Operator of the Philippines (IEMOP) assumed the market operations functions of the WESM on 26 September 2018. PEMC retains its role as the WESM governing entity. PEMC thereafter entered into an Operating Agreement with the IEMOP on 19 September 2019 which details the transfer of the market operator functions. For purposes hereof, IEMOP shall be hereinafter alternatively referred to as "Market Operator".
- 2.1.4. Governed by the WESM Rules, the WESM is a venue for trading electricity as a commodity. It serves as a clearing house to reflect the economic value of electricity as indicated by the spot price. The WESM uses the concept of a gross pool market where all electricity output of the generators is centrally coordinated for scheduling

and dispatch. Generators, as well as buyers of bulk electricity, compete for a share of this pool to be dispatched and scheduled to meet the electricity demand in real time. The members of the WESM include Generation Companies, Customers, Trading Participants, Network Service Providers, and Metering Services Providers.

- 2.1.5. With respect to policy and regulatory oversight over the WESM, such functions are carried out by the DOE, the Energy Regulatory Commission (ERC) and the Philippine Competition Commission (PCC). The functions of the DOE involve the formulation of the country's overall energy policy, the development and improvement of the WESM design, as well as the promulgation of the WESM Rules and Manuals, including changes thereto.
- 2.1.6. On the other hand, the ERC enforces the provisions of the EPIRA and its implementing rules and regulations and has investigative and quasi-judicial powers over any market participant for violations of the EPIRA, its implementing rules and regulations, and the WESM Rules. The ERC also approves, among others, the market fees being collected by the Market Operator from the market participants to recover the cost of administering and operating the WESM.
- 2.1.7. The PCC, lastly, is an independent quasi-judicial body mandated to implement the national competition policy and enforces Republic Act No. 10667 or the Philippine Competition Act (PCA), which serves as the primary law in the Philippines for promoting and protecting market competition. The PCC acts in partnership with each industry's respective policy oversight and regulatory bodies, including the DOE and ERC, to promote a competitive business environment, deter anti-competitive behaviors, and protect consumer welfare.
- 2.1.8. Nine (9) years into the commercial operations of the WESM, the DOE promulgated Department Circular No. 2015-10-0015 on 23 October 2015 adopting enhancements to the WESM design and operations to address issues that have undermined market efficiency.
- 2.1.9. Following a series of rules changes, system developments, public consultations, information and education campaigns and readiness assessment to put in place the foregoing market enhancements, the DOE declared the commercial operations of the enhanced WESM design and operations on 26 June 2021 in Luzon and Visayas per DOE Department Circular No. 2021-06-0015 dated 25 June 2021.

2.2. Enhanced WESM Design and Operations (EWDO)

- 2.2.1. The EWDO was developed beginning in 2014 based on the recommendations from Phases 1 and 2 of the WESM Design Study (WDS) conducted by a third-party consultant, the Intelligent Energy Systems (IES). The IES was commissioned by

PEMC in April 2013 to examine several market design and implementation issues which were undermining the efficiency of the WESM that were identified in the first Market Operations Audit undertaken by Deloitte and IES (completed in July 2010), and in the second audit undertaken by PA Consulting (completed in August 2011).

2.2.2. The WDS is a comprehensive report consisting of three (3) Phases where the first two were focused on identifying the issues hounding the market at that time and recommendations on changes to the market features to resolve them, while the third report (Phase 3) focused on the options for implementing a Day-Ahead Market. PEMC endorsed the Study to the DOE for consideration and after thorough review, the following enhancements to the market design and operations were adopted per DOE Department Circular No. 2015-10-0015 dated 23 October 2015:

- a) Removal of Pmin constraint in the MDOM;
- b) Shorter trading and dispatch interval of five (5)-minute;
- c) Ex-ante pricing only for every five (5)-minute trading and dispatch interval;
- d) One (1)-hour settlement interval for settlement purposes based on weighted average of the five (5)-minute ex-ante prices;
- e) Automated pricing corrections;
- f) Mandatory integration of Distribution Utilities' sub-transmission network, which materially affect dispatch schedules and prices in the WESM, into the Market Network Model (MNM);
- g) Changing the values and priorities of some of the Constraint Violation Coefficients (CVCs), including the corresponding values thereof taking into consideration the imminent implementation of the WESM Reserve Market;
- h) Imposition of WESM offer cap and floor for energy and reserve as determined through joint study by the DOE, Energy Regulatory Commission (ERC) and PEMC;
- i) Implementation of hourly Day-Ahead Projection (DAP) with sensitivities and Hour-Ahead Dispatch (HAD);
- j) Implementation of nodal-based short-term demand forecasting;
- k) Enhanced training of WESM participants; and
- l) Any other enhancements as may be deemed necessary and issued by the DOE.

2.2.3. Since 2015, PEMC proposed a number of rules changes to the Rules Change Committee (see Annex) and also undertook the development of a New Market Management System (NMMS), Central Registration and Settlement System (CRSS), and Compliance Post Evaluation Monitoring System (CPEMS) to implement the procedural and operational changes arising from the adopted market design changes. Further changes to the rules were proposed by the independent market operator (IMO) and System Operator for the EWDO in 2018 onwards. Table

1 provides key differences in the market features between the previous and the enhanced (current) market design:¹

Table 1 Comparison of Previous and Enhanced (Current) Market Design

| Market Design / Operations | Previous Design | Enhanced (Current) Design |
|---|--|---|
| Dispatch Interval | 1 hour | 5 minutes |
| Consideration of P_{min} | Priority dispatch | Submitted as offer |
| Pricing | Ex-ante and Ex-post | Ex-ante only |
| Market Re-runs | Manual Market re-runs | Automatic pricing re-runs |
| Market Projections | Day-ahead projections (DAP) every four (4) hours | <ul style="list-style-type: none"> DAP every one (1) hour with sensitivities Hour-ahead projections (HAP) every five (5) minutes |
| Compliance Monitoring | Manual dispatch conformance monitoring | Automatic dispatch conformance monitoring for energy |
| Scheduling/ Trading of Energy and Reserves | Central scheduling and dispatch of energy and contracted reserves | <ul style="list-style-type: none"> Central scheduling and dispatch of energy and contracted reserves is still implemented Proposed reserve market was deferred, pending approval of implementation. |
| Settlements | <ul style="list-style-type: none"> One hour interval and resolution for energy Two-part settlement | <ul style="list-style-type: none"> One hour settlement interval and 5-minute resolution for energy One-part settlement |
| Administered Prices | Calculated during settlement | Calculated by NMMS |
| Price Substitution Methodology (PSM) Settlement | Adjustments made during settlement | PSM prices by NMMS is binding |

¹ PEM Audit Committee, *PEM Audit Committee Report on the Market Readiness Assessment (MRA)*, May 2019.

| Market Design / Operations | Previous Design | Enhanced (Current) Design |
|---|---|---|
| Possible compensation of plants instructed by the SO to decrease output | Concept of Must-Stop Unit and Displaced Generators | None |
| Must-Run Unit (MRU) Settlement | Generation Price Index (GPI) plus additional compensation | Market price plus additional compensation |

2.2.4. Market Readiness Assessment (MRA) activities were thereafter conducted between 2019 to 2021 to ensure the effective transition to and implementation of the enhanced WESM design and operations in Luzon and Visayas, and the WESM in Mindanao. The MRA activities monitored the compliance of PEMC, Market Operator, System Operator, Metering Services Providers, and WESM participants with the market readiness criteria which signals their respective preparedness for the transition to the EWDO regime. Among the readiness activities is the conduct of the Parallel Operations Program (POP) led by the Independent Electricity Market Operator of the Philippines (IEMOP, Market Operator) to allow all stakeholders to be familiarized and exercise the revised WESM processes, specifically in terms of trading, dispatch, and settlement.

2.2.5. With all required readiness conditions met, including the approval of critical rules changes (i.e., Price Determination Methodology for EWDO), the DOE declared the commercial operations of the EWDO effective 26 June 2021 pursuant to DOE Department Circular No. 2021-06-0015 dated 25 June 2021.

2.3. Basis for the Conduct of Enhanced WESM Design and Operations Implementation Review

PEMC included in its Corporate Strategic Plan for 2023-2025 the assessment of the implementation of the EWDO. As the Governance Arm of the WESM, PEMC is mandated to ensure the achievement of WESM objectives, which is to establish and maintain a competitive, efficient, and reliable market for electricity². Since the enhancements made to the design and operations of the WESM aim to contribute towards obtaining said goals, it is within the responsibility of PEMC to evaluate whether the objectives of the changes have been met in almost two (2) years of implementation. This is also a crucial public policy question to evaluate whether the issues that have afflicted the market since its launch in 2006 have been finally addressed, or a different direction in the market process or design is in order.

² WESM Rules Clauses 1.2.5 and 1.4.5(d).

2.4. The Day-Ahead Market³

- 2.4.1. In general, the goal of a Day-Ahead Market is to ensure in advance that there is adequate capacity in terms of power supply and ancillary services for the next day, which brings more reliability in the market. Participants buy and sell electricity in advance ahead of real-time conditions. The clearing price is determined where the supply bids meet the demand bids. Generators are scheduled based on stacking the lowest to highest bids until the demand is met, and in consideration of resource and transmission constraints. Necessary additional energy not procured via the DAM may be secured via a real-time market.

Like the real-time market, running a DAM requires data such as system parameters (network model), resource parameters (e.g., plant type, Pmin/Pmax, ramp rates, etc.), outage information, demand forecast, transmission line limits, supply bids, and demand bids. Additional necessary inputs are the reserve requirements and extra unit commitments to meet the forecasted demand not met through the day-ahead schedules.

- 2.4.2. Phase 3 of the WDS provided four (4) options for implementing a DAM in the WESM, summarized as follows:⁴

- Option 1: Market with information-driven day-ahead processes (Australian NEM or WESM with an enhanced DAP)
- Option 2: Market with compulsory technical DAM (representative US market)
- Option 3: Market with compulsory financial DAM and intra-day trades (based on Nord Pool)
- Option 4: Market with optional financial DAM and intra-day trades

The Report implied that any one of the foregoing general DAM designs should be executed and the benefits be fully reaped only if the recommended enhancements in Phases 1 and 2 of the WDS have been implemented. Among the options, IES suggested that Options 1 and 4 are the most viable as they maintain the decentralized design principle of the WESM.

- 2.4.3. The Technical Committee (TC) posited that transitioning to a DAM arrangement may be implemented through a two-step program: first by employing Day-Ahead Bilateral

³ Hinman, Cynthia, "Day-Ahead Market Overview," *California ISO*. 30 November 2021, <http://www.caiso.com/InitiativeDocuments/Presentation-Day-AheadMarketOverview-Nov30-2021.pdf> (accessed May 25, 2023)

⁴ Intelligent Energy Systems & SW Advisory, *WESM Design Study: Phase 3 Report: Assessment of a Day-ahead Market*, (17 January 2014), page 39.

Scheduling (DABS), followed by the full implementation of a DAM.⁵ A DABS scheme would require generators to submit their bilateral contract quantities (BCQ) for scheduling one day ahead of dispatch, in contrast to the current setup whereby BCQ is declared after actual dispatch for settlement purposes only. DABS shall serve as precursor for a DAM since it would emphasize accountability of participants due to the binding nature of the BCQ, require unit commitment because of advanced scheduling, unburden real-time market processes since schedules of contracted capacities are determined day ahead, and encourage demand side participation.

2.5. Basis for the Conduct of Feasibility Study on the Day-Ahead Market (DAM)

- 2.5.1. Among the responsibilities of the TC of the WESM is to assist the PEM Board and the DOE in the formulation of policies that will help the achievement of a sustainable, competitive, efficient, transparent and reliable market for electricity.⁶ With the implementation of the EWDO in 2021, the TC steered its efforts towards examining at the policy level whether the enhanced market design successfully addressed the major issues that undermined the market since 2006 as cited in the WESM Design Study.
- 2.5.2. While the recommendations provided in Phases 1 and 2 of the WESM Design Study were mostly adopted and implemented through the EWDO program, the TC noted that Phase 3 of the same Study, which was focused on the advantages, disadvantages, and several options for implementing a DAM in the WESM, were not. The TC re-visited the Phase 3 Study in parallel with its high-level monitoring of the technical aspects of the enhanced market operations, and in 2022, conducted a preliminary study on the possible implementation of a DAM in the WESM.⁷ The TC's preliminary study involved, among others, consultations with the Market Operator and System Operator to gather feedback on the issues or challenges encountered so far in the implementation of the EWDO. The Committee concluded that discussions on the possibility of establishing a DAM in the WESM should be revived to enable more transparency and certainty in the market which the current market design, even with the enhancements, still falls short of.

⁵ Technical Committee, *Day-Ahead Market in the WESM*, 2022.

⁶ Technical Committee Market Manual, Section 3.1.1.

⁷ Technical Committee, *Day-Ahead Market*, 2022.

3. OBJECTIVE OF THE PROJECT

This project aims to engage a consultant within 2023 to conduct the Market Design and Operations Review within the first to second quarters of 2024, which has two (2) components, namely:

- 1) Enhanced WESM Design and Operations Implementation Review; and
- 2) Feasibility Study on Day-ahead Market.

4. PROJECT SCOPE

4.1. Period Covered

4.1.1. The EWDO Implementation Study component of the Project shall cover the period 26 June 2021, corresponding to the commercial launch of the EWDO, up to within 2nd quarter 2024. Around two (2) years since implementation is deemed an appropriate period to commence evaluation of the effectiveness of the enhancements since material data and/or market outcomes would have already been available and sufficient. However, data from the previous market design regime may also be reviewed as the study requires or for benchmarking purposes.

4.1.2. For the DAM Feasibility Study component of the Project, there is no definite covered period to which the study should only focus on since the requirements of the study dictate the material information for review.

4.2. Applicable Rules

The following shall guide the consultant in the conduct of the studies:

- 1) WESM Rules and its Market Manuals;
- 2) Proposed rules changes related to the implementation of the EWDO;
- 3) WESM Design Study Phases 1, 2 and 3;
- 4) Technical Committees Preliminary Study on the Day-Ahead Market; and
- 5) Relevant Circulars, Orders and other Issuances or directives of the DOE and ERC.

4.3. Scope of Work

4.3.1. Enhanced WESM Design and Operations Implementation Review

The Consultant shall:

- 1) Evaluate the effectiveness of the enhancements made to the WESM design and operations as enumerated in DOE DC2015-10-0015 and summarized in Table 1. More specifically, the Implementation Review shall examine whether the objectives of the EWDO-related rules changes were met (see Annex). These rules changes provide basis for the implementation of the new or revised market processes. The Consultant may employ accepted policy/project effectiveness methodologies or approaches to evaluate said rules changes;
- 2) Identify prevailing issues in the current market design and provide recommendations on possible approaches, or market design changes, if necessary, to address them. Such issues include, but are not limited to the following:⁸

Table 2 Challenges and Issues in Current Market Design

| Market Process | Challenges/Issues/Remarks |
|-----------------------|--|
| Market Projections | <ol style="list-style-type: none">i. Inaccuracy of Week-Ahead Projections and Day-Ahead Projections due to un-updated offers from Market Participants;ii. Inaccurate projected outputs from Variable Renewable Energy plants which triggers generator re-dispatch by the System Operator;iii. Unreliability of nodal-based demand forecasts due to non-updating real-time data |
| Market Network Model | Inaccurate load flows in the MDOM because the looped connections of large DUs are still not reflected in the MNM |
| Schedule and Dispatch | <ol style="list-style-type: none">i. Effectiveness of 5-minute vis-à-vis 1-hour dispatch interval should be evaluated;ii. Revisit integration of Pmin commitment binary constraint in the MDOM in the case of hydropower and peaking plants that are ancillary service providers; |

⁸ Technical Committee, *Consultations on Enhanced WESM Design and Operations (EWDO) and Implementation of the Day-ahead Market (DAM)*, 2022.

| Market Process | Challenges/Issues/Remarks |
|----------------|--|
| | <ul style="list-style-type: none"> iii. Revisit System Operator's concerns in prioritizing reserve capacities over thermal constraints; iv. Energy and reserves are still not co-optimized since corresponding price determination methodology is still pending ERC approval; and v. Occurrence of Market Management System-related declaration of market intervention vi. Manual re-run due to pricing errors vii. Effectiveness of automatic relaxation of constraints as part of automatic pricing rerun |
| Market Pricing | Effectiveness of ex-ante pricing only for every 5-minute trading and dispatch interval needs to be assessed |
| Settlement | Settlement of ancillary services based on dispatch interval prices and quantities is not implemented yet since there is still no reserve market. |
| Others | <ul style="list-style-type: none"> i. There is still a need to issue pricing error notices due to erroneous real-time data. Enhancements need to be employed to mitigate such issues (e.g., state estimator). ii. Possible compensation of displaced generators⁹ iii. Possible necessary enhancements to IT infrastructure, systems, and processes |

- 3) Conduct focused group discussions and/or consultation meetings with market participants and relevant parties/agencies (see Table 3);
- 4) Provide simulations and impact analysis to support the recommendations;
- 5) Identify possible rules changes to implement said recommendations; and
- 6) Present reports to PEMC, DOE, ERC, IEMOP and, as necessary, WESM Governance Committees

4.3.2. Feasibility Study on Day-ahead Market

For a start, the Consultant shall review Phase 3 of the WESM Design Study, the TC's Preliminary Study on the Day-Ahead Market, and the TC's Consultations on the EWDO and the Implementation of the Day-Ahead Market as primary references.

⁹ PEMC, *Discussion Paper on the Possible Compensation of Displaced Generators* (submission to ERC in compliance to ERC directive), March 2021.

The insights and recommendations therein shall be studied to determine if they are suitable given current market conditions. Based on the proposed scope of work by the TC's Study¹⁰, the Consultant is expected to:

- 1) Determine suitable day-ahead market design considering local conditions and current developments using historical data, system simulations, and cost-benefit analyses;
- 2) Conduct focused group discussions and/or consultation meetings with market participants and relevant parties/agencies (see Table 3);
- 3) Provide simulations and impact analysis to support the design recommendations;
- 4) Review market policies, regulations, rules, and procedures that will be affected by, or will influence the implementation;
- 5) Cost estimate of the implementation including but not limited to information system changes, consultancy, training, and system impact studies;
- 6) Provide project implementation and general transition plans and schedules covering selection of consultants, procurement of systems, acceptance testing, operator/participant training, limited live dispatch, and commercial operations; and
- 7) Present reports to PEMC, DOE, ERC, IEMOP and, as necessary, WESM Governance Committees

5. PROPOSED ARRANGEMENTS

5.1. Project Schedule

Below are the details of the activities to be conducted for the completion of the project with the corresponding tentative schedules.

¹⁰ Technical Committee, *Day-Ahead Market*, page 6.

Table 3 Project Schedule

| Activities / Timeline | Output | Timeline | Involved Parties | | | | |
|--|--|--------------------------------------|---|---|---|----------|---|
| | | | Responsible | Consulted | Recommending Approval | Approver | Informed |
| Market Design and Operations Review 1 st to 2 nd Quarter 2024 | Inception Report | January 2024 | <ul style="list-style-type: none"> • Consultant • Secretariat • MDOR-TWG | <ul style="list-style-type: none"> • DOE • ERC • MO • PEMC • SO • WGC | <ul style="list-style-type: none"> • OCGO | OP | <ul style="list-style-type: none"> • PEM Board |
| | Consultation Meetings (FGDs) | January-June 2024 | <ul style="list-style-type: none"> • Consultant • Secretariat | <ul style="list-style-type: none"> • MDOR-TWG • DOE • ERC • MO | n/a | n/a | |
| | Consultation Meetings (event) | *specific schedules to be determined | <ul style="list-style-type: none"> • Consultant • OP/SED • FGSD • Secretariat | <ul style="list-style-type: none"> • Sectors (Generation, Distribution, and Supply) | <ul style="list-style-type: none"> • OCGO • FGSD Head | • OP | |
| | EWDO Implementation Review Report | Draft – March 2024 | <ul style="list-style-type: none"> • Consultant • Secretariat • MDOR-T WG | <ul style="list-style-type: none"> • SO • WGCs | <ul style="list-style-type: none"> • OCGO | • OP | <ul style="list-style-type: none"> • PEM Board • DOE • ERC • Others via web posting |
| | Feasibility Study on Day-ahead Market Report | Final – June 2024 | | | | | |
| | PEMC Report | July 2024 | <ul style="list-style-type: none"> • MDOR-TWG | <ul style="list-style-type: none"> • WGC | <ul style="list-style-type: none"> • OCGO | • OP | <ul style="list-style-type: none"> • PEM Board • DOE • ERC • Others via web posting |

5.2. Deliverables

The Consultant shall submit the following reports:

- a) Inception Report – It shall contain the Consultant’s Methodology and Work Program. This shall confirm the project scope and outline the approaches for the two study components, including the schedule of consultations with WESM stakeholders (e.g., focused group discussions, etc.)
- b) EWDO Implementation Review Report – This report shall contain the results of the study evaluating the effectiveness of the EWDO and the recommendations to address issues that may be identified during the conduct of the study.
- c) Feasibility Study on Day-ahead Market Report – This report shall contain the assessment on the feasibility of implementing a Day-Ahead Market in the WESM and recommendations on the design suitable for local conditions and a broad plan for its introduction in the WESM.

The timelines for the submission of the draft and final reports are in Section 1.7.1 above.

5.3. Qualifications of Consultants

- 5.3.1. The Consultants shall be composed of professionals and experts in the design of power market systems, particularly on the impact of design to prices, electricity trading, market operations, grid operations and regulatory policies. They shall have competence and adequate experience in understanding nuances of local electricity markets to properly provide comprehensive advisory services as required by the project.
- 5.3.2. The project is open for local and foreign consultants. Joint venture partnership is allowed.

5.4. Interface between the Consultants and PEMC

- 5.4.1. The Consultants shall report to the Market Design and Operations Review-Technical Working Group (MDOR-TWG) for the duration of the project.

5.4.2. All activities of the Consultants shall be accordingly coordinated with the MDOR-TWG, through the TWG Secretariat. The TWG Secretariat shall provide linkages between the MDOR-TWG, PEMC, Market Operator, System Operator, DOE, ERC, the Technical Committee, and other WGC Committees, as necessary. It shall extend all reasonable support to the Consultants for the duration of its services, which support shall include, among others:

- a) Provide necessary office space, internet access, access pass, etc.;
- b) Facilitate access to all data and information for the conduct of the studies; and
- c) Arrange coordination meetings with relevant entities to discuss issues and concerns pertaining to the conduct of the studies.

5.5. Confidentiality

5.5.1. Definition. As used herein, "Confidential Information" shall refer to all information furnished to the Bidder and/or any officers, directors, employees, affiliates, outside auditors and legal, technical, financial advisors, agents or other representatives of Bidder (herein referred to as Representatives) supplied by PEMC or any of its representatives in connection with the Subject of the Bid. including without limitation, any information relating to the Bid or PEMC together with any analyses, compilations, notes, summaries, studies or other documents or materials prepared, developed, derived, discovered or collated by or on behalf of the Bidder or its representatives which contain or otherwise reflect such information. All such disclosures, in any format, shall be marked or reasonably made known to be Confidential and/or Proprietary information.

5.5.2. Without limiting the generality of the foregoing, Confidential Information shall further include:

- a) Information contained in the Request for Proposal of PEMC dated XX August 2023;
- b) Information obtained by Bidder and its Representatives during (i) bidding process; (ii) meetings/consultation with PEMC and parties that may be invited by PEMC; and (iii) through any management presentation by PEMC to the Consultant;
- c) Information contained in any other written material furnished or otherwise made available to the Consultant;
- d) Information furnished to the Consultant electronically;
- e) Information presented to the Consultant or its representatives;
- f) information provided by PEMC to Consultant that is marked confidential;
- g) if disclosed orally or not marked confidential, is identified prior to its disclosure as confidential information, and is confirmed confidential information in a signed writing by PEMC promptly thereafter; or

- h) PEMC treats such information as confidential; or
- i) such information can be reasonably considered as confidential information based upon the nature of the information and the business of PEMC; or
- j) without designation or limitation, is related to the Project.

5.5.3. Ownership. All rights, title and interest in the Confidential Information and materials are and shall remain the sole property of PEMC, as may be warranted.

5.5.4. The Bidder acknowledges that PEMC has the exclusive right to determine what information the latter may choose to furnish the Bidder. Neither PEMC nor any of its Representatives shall be liable to the Bidder or any other person arising out of or relating to their interpretations of or conclusions based on the Confidential Information.

5.6. Bidder's Obligations

Unless PEMC gives its prior written authorization, the Bidder shall, during a period of two (2) to ten (10) years from the date of disclosure of any Confidential Information, depending on the confidential nature of the information disclosed.

5.7. Data Privacy

5.7.1. The Consultant acknowledges and agrees that, in the course of providing the Services, it may receive or have access to Personal Information of PEMC's directors, officers, employees, market participants, governance committee members and authorized representatives. As used in this Agreement, "Personal Information" shall have the meaning ascribed to it under Republic Act No. 10173, and its implementing rules and regulations, as may be amended from time to time (the "Data Privacy Act").

5.7.2. The Consultant represents and warrants that its collection, access, use, storage, disposal, and disclosure of any Personal Information shall at all times comply with the Data Privacy Act and all other applicable data privacy and data protection laws and regulations. The Consultant shall also comply with the terms and conditions set forth in this Agreement in its collection, receipt, transmission, storage, disposal, use, and disclosure of Personal Information.

5.7.3. In the event that the Consultant will act as a Personal Information Processor, the Consultant shall:

- a) Process the personal data, including transfers of personal data to another country or an international organization, only upon the documented instructions of PEMC;
- b) Ensure that an obligation of confidentiality is imposed on persons authorized to process the personal data;
- c) Implement appropriate security measures and comply with the Data Privacy Act and other relevant issuances of the National Privacy Commission (“NPC”);
- d) Not engage another Personal Information Processor without prior instruction from PEMC: Provided, that for any such arrangement authorized by PEMC, the Consultant shall ensure that the same obligations for data protection under this Agreement are implemented, taking into account the nature of the processing;
- e) Assist PEMC, by appropriate technical and organizational measures and to the extent possible, fulfil the obligation to respond to requests by data subjects relative to the exercise of their rights;
- f) Assist PEMC in ensuring compliance with the Data Privacy Act, other relevant laws, and other issuances of the NPC, taking into account the nature of processing and the information available to the Consultant;
- g) At the option of PEMC, delete or return all personal data to PEMC after the end of the provision of services relating to the processing: Provided, that this shall include deleting existing copies unless storage is authorized by the Data Privacy Act or other relevant laws;
- h) Make available to PEMC all information necessary to demonstrate compliance with the obligations laid down in the Data Privacy Act, and allow for and contribute to audits, including inspections, conducted by PEMC or another auditor mandated by the latter; and
- i) Immediately inform PEMC if, in its opinion, an instruction infringes the Data Privacy Act, or any other applicable issuance of the NPC.

ANNEX A – Rules Amendments for the Implementation of the Enhanced WESM Design and Operations¹¹

| Document/Information | Description | DOE Approval | Location |
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| Rules change proposals to implement EWDO | | | |
| 1. Proposed Amendment to the WESM Rules for the Implementation of Enhancements to WESM Design and Operations <i>Reference:</i> <i>RCC Resolution No. 2016-05 (03 Mar 2016)</i> | Amendments as a result of Phases 1 and 2 of the WDS; enhancements to WESM design and operations pursuant to DOE directives | DC2016-10-0014 | <ul style="list-style-type: none">• Original Proposal (ORCP-WR-15-22)<ul style="list-style-type: none">○ Paper○ Matrix○ Attachment• RCC Resolution No. 2016-05 |
| 2. Proposed Amendments to the WESM and Retail Rules and Various Manuals for the Implementation of WESM Design Enhancements <i>References:</i> <ul style="list-style-type: none">• <i>RCC Resolution No. 2017-04 (11 Apr 2017)</i>• <i>RCC Resolution No. 2017-05 (11 Apr 2017)</i>• <i>RCC Resolution No. 2017-08 (07 Jul 2017)</i>• <i>RCC Resolution No. 2017-09 (07 July 2017)</i>• <i>RCC Resolution No. 2017-10 (10 Nov 2017)</i> | Amendments to procedures to implement the following market features: <ul style="list-style-type: none">(i) Five (5) minute dispatch interval;(ii) Ex-ante pricing only for energy and reserves for every 5-minute dispatch interval;(iii) One (1) hour settlement interval for settlement purposes;(iv) Automatic pricing corrections;(v) Mandatory integration of Distribution(vi) Utilities' sub-transmission network, which materially affect dispatch schedules and prices in the WESM, into the market network model (MNM);(vii) Nodal-based short-term demand forecasting; and(viii) Hourly day-ahead projection (DAP) with sensitivities and hour-ahead projection (HAP) | <ul style="list-style-type: none">• DC2018-04-0007• DC2018-04-0008• DC2018-04-0009• DC2018-05-0015 | <ul style="list-style-type: none">• Original Proposal (ORCP-WR-RR-WM-16-26)<ul style="list-style-type: none">○ Paper○ WESM Rules – Matrix○ Retail Rules – Matrix○ Billing and Settlement – Matrix○ Dispatch Protocol – Matrix○ Load Forecasting – Matrix |

¹¹ RCC Resolutions may be accessed at the PEMC website (<https://www.wesm.ph/market-governance/rules-change/rcc-resolutions>)

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| | | | <ul style="list-style-type: none"> ○ Retail Metering – Matrix ○ WESM Metering - Matrix • RCC Resolution No. 2017-04 (11 Apr 2017) • RCC Resolution No. 2017-05 (11 Apr 2017) • RCC Resolution No. 2017-08 (07 Jul 2017) • RCC Resolution No. 2017-09 (07 July 2017) • RCC Resolution No. 2017-10 (10 Nov 2017) |
| <p>3. Proposed General Amendments to the WESM Manuals on Price Determination Methodology (PDM) and Constraint Violation Coefficient (CVC) and Pricing Re-run for the Implementation of WESM Design Enhancements</p> <p><i>References:</i> RCC Resolution No. 2016-13 (26 Oct 2016) RCC Resolution No. 2017-07 (09 Jul 2017)</p> | <p>a) Amendments to WESM Manual on Price Determination Methodology:</p> <ul style="list-style-type: none"> (i) provide final prices for energy and reserves in real-time; (ii) consider the integration of reserves into the WESM in the determination of substitute prices during pricing errors due to network congestion; (iii) reflect the actual generation and consumption and provision of reserves in the settlement calculation; (iv) allocate the net settlement surplus to trading participants that paid congestion; (v) consolidate all pricing and settlement provisions and equations into one manual; (vi) revise the proposed calculation of price adjustment for customers in the non-administered region to ensure there is no | <ul style="list-style-type: none"> • DC2017-03-0001 • DC2018-04-0012 • ERC Decision on Case No. 2017-042RC | <ul style="list-style-type: none"> • Original Proposal (ORCP-WM-16-17 & ORCP-WM-16-18) – <ul style="list-style-type: none"> ○ Paper ○ Matrix (PDM) ○ Proposed PDM and Appendix (formatted) ○ Matrix (CVC Manual) ○ Proposed CVC Manual (formatted) • RCC Resolution No. 2016-13 |

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| | <p>cross-subsidy when the administered region under market intervention or suspension is exporting power to the non-administered region;</p> <p>(vii) clarify that both Must-Run Units and constrained-on generating units may apply for additional compensation;</p> <p>(viii) specify that Must-Run Units or constrain-on generators are price takers; and</p> <p>(ix) delete the provision stating that administered price will only be applied to an isolated portion of the grid under market suspension or intervention.</p> <p>b) Amendments to WESM Manual on Constraint Violation Coefficient (CVC) and Pricing Re-run:</p> <p>(i) revise CVC hierarchy;</p> <p>(ii) Implementation of automatic pricing re-runs and conduct of market pricing re-runs upon the issuance of pricing error notices;</p> <p>(iii) add constraints to provide the details of the categories and distinguish the priority among transmission equipment,</p> <p>(iv) revise the nomenclature of certain CVCs to be consistent with those used in the 2016 Philippine Grid Code; and</p> <p>(v) clarify the actions undertaken by the System Operator during instances when certain CVCs are violated.</p> | | <ul style="list-style-type: none"> RCC Resolution No. 2017-07 |
| 4. Proposed Amendments to the WESM Manual on Dispatch Protocol for the Optimal Timing of Market Runs | Amendments to optimize the timing of dispatch scheduling activities considering system performance and System Operator requirements for the Day-Ahead Projection Hour-Ahead Projection and Real-Time Dispatch market runs | DC2020-10-0020 | <ul style="list-style-type: none"> Original Proposal (ORCP-WM-19-14) – paper, matrix, annex |

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| <i>Reference:</i> RCC Resolution No. 2019-16 (08 Nov 2019) | | | <ul style="list-style-type: none"> • RCC Resolution No. 2019-16 |
| 5. Proposed Amendments to the WESM Manual on Load Forecasting Methodology for the Inclusion of the Procedures for Preparation and Updating of Nodal Load Distribution Factors <i>Reference:</i> RCC Resolution No. 2020-11 (15 May 2020) | Amendments to include the procedures for the preparation and updating of load distribution factors: 1) Each nodal load shall have LDFs for each hour and each day type ; 2) Each nodal load shall have LDFs updated every five (5) minutes based on either (a) latest real-time data or (b) an estimated value; 3) In determining the LDF for each nodal load: (i) Obtain base MW values for each nodal load; (ii) Once all base MW values are obtained, compute for LDF using specified formula; and (iii) If a nodal load does not have real-time data, an additional set of procedures will be performed to estimate the value of its base MW before calculating the LDF | DC2021-03-0005 | <ul style="list-style-type: none"> • Original Proposal (ORCP-WM-20-05) <ul style="list-style-type: none"> ○ Paper ○ Matrix ○ Appendix • RCC Resolution No. 2020-11 |
| 6. Proposed Amendments to the WESM Manual on Dispatch Protocol (Issue 13.0) to Enhance Procedures in Must-Run Unit (MRU) Accounting <i>Reference:</i> RCC Resolution No. 2020-03 (12 Feb 2020) | Amendments to improve accounting of energy produced due to a must-run unit dispatch instruction and processing of discrepancy reports | DC2021-03-0006 | <ul style="list-style-type: none"> • Original proposal (ORCP-WM-19-18) <ul style="list-style-type: none"> ○ Paper ○ Matrix • RCC Resolution No. 2020-03 |
| Rules change proposals to address EWDO-related issues | | | |
| 7. Proposed Amendments to the WESM Rules and relevant WESM Manual regarding the Effectivity of Settlement of Displaced Generators | Amendments to: | DOE remanded the proposal in support of ERC's directive | <ul style="list-style-type: none"> • Original proposal (ORCP-WR-WM-20-06) |

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| <p><i>Reference:</i> RCC Resolution No. 2020-12 (15 May 2020)</p> | <ol style="list-style-type: none"> 1) Clarify that the settlement methodology for Displaced Generators, as stated in Section 10 in the version of the <i>WESM Manual on Management of Must-Run and Must-Stop Units</i> for the 1-hour dispatch interval market regime, shall be effective only until commercial operations of the enhanced market design; and 2) remove the terms ‘must-stop unit’ and ‘displaced generators’ and all references thereto in the version of the WESM Rules for enhanced market design | <p><i>for PEMC to submit a proposal for the possible compensation of displaced generators</i></p> | <ul style="list-style-type: none"> • RCC Resolution No. 2020-12 • PEMC Discussion Paper on Possible Compensation of Displaced Generators in compliance to ERC’s directive |
| <p>8. Proposed Amendments to the Protocol on Central Scheduling and Dispatch of Energy and Contracted Reserves</p> <p><i>Reference:</i> RCC Resolution No. 2020-06 (01 Apr 2020)</p> | <p>Amendments to reflect the following:</p> <ul style="list-style-type: none"> • Scheduling is within ramp-limited energy and upward / downward regulation capability every five (5) minutes during real-time dispatch • Dispatchable reserve providers can conform to the ancillary service nomination from its off-line state • Improve accounting of quantities for additional compensation claims in the WESM • Clarify compliance requirements of ancillary service providers with the Central Scheduling Protocol under their Ancillary Services Procurement Agreements | <p>DC2021-05-0010</p> | <ul style="list-style-type: none"> • Original proposal (ORCP-WM-20-10) • RCC Resolution 2020-06 |
| <p>9. Proposed Amendments to WESM Rules and Various WESM Manuals for Enhancements to Market Operator and System Operator Procedures</p> <p><i>Reference:</i> RCC Resolution No. 2021-14 (10 Oct 2021)</p> | <p>Amendments to reflect the following:</p> <ol style="list-style-type: none"> 1) Use nomenclature for reserves types (i.e. regulation, contingency, and dispatchable) as provided under DOE Department Circular No. DC2019-12-0018; 2) Replace the term ‘system snapshot’ with ‘real-time data’, including the reference to the Market Network Modelling Criteria and Procedures (MNMCP) Manual concerning the required type of information for these data; 3) Clarify the process for updating SO constraints data in the NMMS; 4) Submission of day-ahead projected output from must dispatch generating units to the System Operator; | <p>DC2022-06-0023</p> | <ul style="list-style-type: none"> • Original proposal • RCC Resolution No. 2021-14 |

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| | 5) Enhancements on the creation of the Merit Order Table (MOT), specifically on the exclusion of scheduled reserve capacities and outages, and on the MO's provision of MOT to the SO 6) Process enhancements on dispatch implementation; 7) Provide definition of automatic generation control (AGC) aligned with the Philippine Grid Code and include guidelines on dispatch via AGC; 8) Improvements in post-dispatch reporting; 9) Registration of option for generator availability for WESM scheduling; 10) Improve process on MNM Development and Deployment; 11) Allow urgent updates to the MNM; and 12) Improve documentation and reporting | | |
| 10. Proposed Amendments to the WESM Rules and WESM Manual on Billing and Settlement on Harmonization with ERC Decision on Case No. 2017-042RC on Additional Compensation Process <i>Reference:</i> <i>RCC Resolution No. 2021-19 (21 Oct 2021)</i> | Amendments to: 1) harmonize the WESM Manual on Billing and Settlement with the ERC Decision on ERC Case No. 2017-042RC (i.e., ERC Decision on the Price Determination Methodology for EWDO); 2) provide supplementary guidelines on the additional compensation process in the WESM Manual on Billing and Settlement; and 3) consistently apply the guidelines to the different pricing or dispatch conditions eligible for additional compensation | DC2022-06-0025 | <ul style="list-style-type: none"> • Original proposal (ORCP-WM-21-09) • RCC Resolution No. 2021-19 |
| 11. Proposed Amendments to WESM Rules and WESM Manual on Constraint Violation Coefficients and Pricing Re-runs, Issue 6 on Harmonization of Provisions on Automatic Pricing Re-runs with ERC Decision on Case No. 2017-042RC <i>Reference:</i> <i>RCC Resolution No. 2021-22 (17 Dec 2021)</i> | Amendments to harmonize provisions on automatic pricing re-runs in the WESM Rules and Manuals for the EWDO with the ERC directives provided in its Decision dated 20 August 2020 (and promulgated on 29 December 2020) on ERC Case No. 2017-042RC regarding the proposed Price Determination Methodology (PDM) for the EWDO | DC2022-06-0024 | <ul style="list-style-type: none"> • Original proposal (ORCP-WR-WM-21-10) • RCC Resolution No. 2021-22 |

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| 12. Proposed Amendments to the WESM Rules and WESM Manual on Dispatch Protocol regarding Enhancements and Updating of the System Operator's Re-Dispatching, Reporting and Market Intervention/Suspension Procedures <i>Reference: ORCP-WR-WM-22-14 – Original proposal submitted by proponent (System Operator)</i> | Amendments to update and enhance the System Operator's procedures for re-dispatch implementation, submission of system advisories and significant incident reports, and the procedures during Market Intervention/Suspension | <i>For submission to DOE</i> | Original proposal (ORCP-WR-WM-22-14) |