DEPARTMENT CIRCULAR NO._____

ADOPTING FURTHER AMENDMENTS TO VARIOUS WHOLESALE ELECTRICITY SPOT MARKET (WESM) MANUALS FOR IMPROVEMENTS TO MARKET RESOURCE MODELLING AND MONITORING

WHEREAS, Sections 30 and 37(f) of the Electric Power Industry Reform Act (EPIRA) provides that the Department of Energy (DOE), jointly with the electric power industry participants, shall establish the Wholesale Electricity Spot Market (WESM) and formulate the detailed rules governing the operations thereof;

WHEREAS, on 28 June 2002, the DOE, with the endorsement of the electric power industry participants, promulgated the WESM Rules through Department Circular No. DC2002-06-0003;

WHEREAS, any changes, amendments, and modifications to the WESM Rules, Retail Rules and their Market Manuals shall be undertaken in accordance with the provisions of Chapter 8 of the WESM Rules;

WHEREAS, in a letter dated 09 March 2022, the PEM Board after due deliberation, formally endorsed to the DOE, for final approval, the proposal to refine and clarify the procedures for modelling market resources in the Market Network Model (MNM) and to provide details on the features of modelling generators;

WHEREAS, on _____, the proposal was posted in the DOE website to solicit comments from the stakeholders and other interested parties;

WHEREAS, on _____, the DOE conducted Virtual Public Consultations for Luzon and Visayas-Mindanao Legs, respectively, wherein the proposal was presented;

NOW THEREFORE, after careful review of the PEM Board-approved proposal and the comments and recommendations received on the same, the DOE, pursuant to its authority under the EPIRA and the WESM Rules, hereby adopts, issues, and promulgates the following amendments to Various WESM Manuals for Improvements to Market Resource Modelling and Monitoring:

Section 1.   Amendments to the Market Manual on Load Forecasting Methodology. The following provisions of the Market Manual on Load Forecasting Methodology is hereby amended to read as :

6.2 Unrestrained Net Load Forecast

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6.2.8 The projected load used in Section 6.2.4 may be based on the following information:

    a) Real-time data
    b) Historical load profiles from real-time data
    c) Historical metered quantity profiles
    d) Load profiles from network service providers that shall be regularly updated at least every month

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Section 2. Amendments to the Market Manual on Registration, Suspension and De-Registration Criteria and Procedures. The following provisions of the Market Manual on Registration, Suspension and De-Registration Criteria and Procedures are hereby amended to read as:

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2.5.4.2 Aggregation of Generating Units

A *Generation Company* that owns multiple *generating units* located in a single generating station shall, upon application, inform the *Market Operator* if it wishes to have an aggregated representation for such *generating units* in the *market network model*.

The *Applicant*, the *Network Services Provider*, *Metering Services Provider*, *System Operator,* and the *Market Operator* shall agree on the manner of aggregated representation in accordance with the procedures set forth in relevant *Market Manuals*.

Should the technical information contained in the *Certificate of Compliance or Provisional Authority to Operate (PAO)* or ERC Certificate with appropriate exhibit issued by the *ERC* indicate details per *generating unit*, the following shall be observed when reflecting the aggregated facility's *registered capacity*:

    a) *Maximum Stable Load* (or *Pmax*) shall be based on the sum of the individual *generating unit*'s maximum capacity; and
    b) *Minimum Stable Load* (or *Pmin*) shall be based on the smallest *Pmin* among the individual *generating units*.

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2.5.4.8 Real-Time Monitoring Location

During the registration of the *generating unit*, the *Generation Company* shall specify if its real-time monitoring will be at the gross MW output of the

generating unit or at the same location as its *market trading node,* which is at its *connection point* and net of its station use, in accordance with the guidelines set forth in the *WESM Manual* on Market Network Model Development and Maintenance – Criteria and Procedures.

2.5.5 Assessment of Applications

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Section 3. Amendments to the Market Manual on Market Network Model Development and Maintenance - Criteria and Procedures. The following provisions of the Market Manual on Market Network Model Development and Maintenance - Criteria and Procedures are hereby amended to read as follows:

2.1 Definitions

xxx xxx xxx

2.1.5   *Market Resource* refers to the objects defined in the *Market Network Model* to represent generators, battery energy storage systems, pumped-storage units, and loads.

xxx xxx xxx

3.2 System Operator and Trading Participants

3.2.1   xxx xxx xxx

3.2.2   The *System Operator* and the *Generation Companies* shall ensure that their facilities for real-time monitoring are available and that they accurately reflect the state of their generation (i.e., MW/MVAR output and generator breaker status).

3.2.3   The *Market Operator* shall immediately inform the *System Operator* of any observed discrepancies in the real-time data.

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4.3 Criteria for the Market Network Model Development

4.3.1   xxx xxx xxx

4.3.2   Network data that accurately reflects the conditions prevailing on the network, including losses, constraints and contingencies, at any dispatch interval.

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4.4 MNM Components and Modeling

4.4.1 xxx xxx xxx

4.4.2 Representations of Generator plant/unit *Market Resources*

These are numerical representations of generating units and its characteristics corresponding to power injection to the network. Generating units shall be modeled as the positive power injection with linear monotonically increasing cost function.

4.4.3 Representations of Load *Market Resources*

These are numerical representations of the customer demand corresponding to power withdrawal from the network. Loads shall be modeled as constant power withdrawal points.

4.4.4 *Representations of Battery Energy Storage System Market R*esources

This is the mathematical model of a *battery energy storage system* with its dual capability of injecting or withdrawing power through the network.

4.4.5 *Representations of Pumped-Storage Unit Market R*esources

This is the mathematical model of a *pumped-storage unit* with its dual capability of injecting or withdrawing power through the network.

4.4.6 xxx xxx xxx

4.4.7 Transshipment Node

A node in the network model that has neither a generator nor customer associated to it. A transshipment node connects at least two equipment together.

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4.6 Market Impact Study

The *Market Operator* shall submit the results of the market impact study to the DOE, ERC, and the PEM Board.

The *Market Operator* shall publish a public copy of the same in the market information website, if required by the DOE, ERC, or the PEM Board.

5.0 Updating and Maintenance of the Market Network Model

5.1 xxx xxx xxx

### 5.2 Development of Updates to the MNM

5.2.1 xxx xxx xxx

5.2.2   Updates in the MNM as a result of the aggregation or disaggregation of *market resources* shall be made in accordance with the requirements set forth in Section 5.5 of this *Market Manual*.

5.3 Simplifications on the Market Network Model

5.3.1 xxx xxx xxx

5.3.2   The MNM may contain simplifications related to the representation of *market resources* upon request of a *Trading Participant*. It should be agreed upon by the *Trading Participant*, *Market Operator*, *System Operator*, and if necessary, the *Network Service Provider*. Such simplifications are listed, but not limited to the following conditions**:**

    a)   Aggregated representation of multiple generating units (note: aggregated representation in the MNM may be applied to multiple *generating units* that are located in a single generating station)

    b)   Disaggregated representation of customer trading nodes

    c)   Single Customer Trading Nodes representing an aggregate of multiple customers

    d)   Representation of downstream *generating units* with limited real-time monitoring facilities such as in cases of embedded generators where there is limited availability of real-time monitoring facilities between the transmission system's main substation and the generator, in which case, the *Market Operator* may provisionally model the *generating unit* at the nearest MNM substation to which it is indirectly connected. The following illustration shows an example of this case:
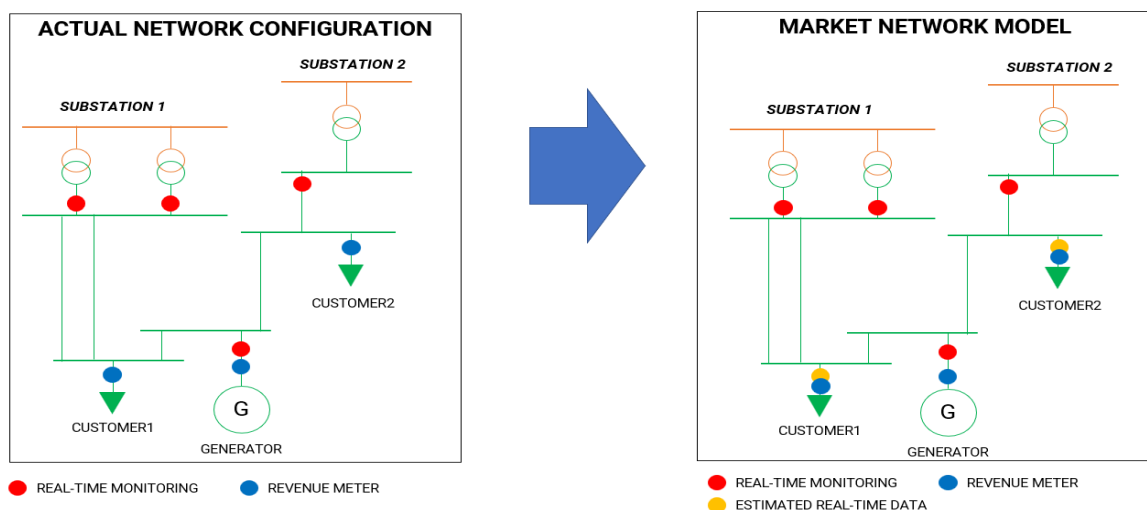
    e)   Representation of downstream *generating units* located in a *distribution network* that is not reflected in the *market network model*. The *Market*

Operator may model the *generating unit* at the nearest MNM substation to which it is indirectly connected.

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5.5 Reporting of MNM Updates

5.5.1 xxx xxx xxx

5.5.2   All publication by the Market Operator regarding the MNM shall be in an un-editable electronic format. The MNM documents shall be published to the general public through the Market Information Website.

5.6 Information Disclosure

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5.10 Continuing Obligations and Responsibilities

5.10.1 xxx xxx xxx

5.10.2 The *System Operator*, in coordination with *Network Service Providers* and *Trading Participants* shall continuously ensure the completeness, availability, and accuracy of the required *real-time data* in the *market network model*.

5.10.3 The *System Operator* shall report real-time monitoring facilities owned or managed by the *Trading Participants* or owned by the System Operator that have been persistently erroneous or non-updating for at least two (2) *business days* to the *Market Operator* and *Enforcement and Compliance Office*. The *Trading Participant* shall endeavor to resolve the issue within fifteen (15) calendar days from the time it was reported.

5.10.4 The *System Operator* in coordination with the Market Operator and Trading Participant shall estimate shall be responsible for estimating *real-time data* that was reported to be erroneous or non-updating.

5.10.5 The Market Operator shall immediately inform the System Operator of any observed discrepancies in the real-time data.

6.0 Modelling of Market Resources

6.1 Background

6.1.1   *Market Resources* shall be modelled in the *market network model* to represent a generator, *battery energy storage system*, *pumped-storage unit*, or *load*. Subject to Section 6.1.2, each *market resource* shall be classified as either a *scheduling point* or a *market trading node* of the generator, *battery energy storage system*, *pumped-storage unit*, or *load*.

6.1.2   It is possible to define only one *market resource* to represent both the *scheduling point* and the *market trading node*.

6.2 Definition

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6.3 Types of Market Resources

 6.3.1 Market Resources can be classified as:

e)   Generator resources – resources that represent a registered generating unit or generating system directly connected to a network operated by the System Operator. It is a resource where power is injected into the transmission network.

f)   Customer resources – resources that represent where power is withdrawn by Trading Participants from the grid.

g)   Battery Energy Storage System resources – resources that represent a registered battery energy storage system directly connected to a network operated by the System Operator. It is a resource where power is injected or withdrawn through the transmission network.

h)   Pumped-Storage Unit resources – resources that represent a registered pumped-storage unit directly connected to a network operated by the System Operator. It is a resource where power is injected or withdrawn through the transmission network.

6.3.2   For *generating units* registered and modelled net of its station use, the *Trading Participant* shall have a generator and a customer resource registered in the WESM to accurately reflect the direction of power flow.

6.4 Guidelines for Modelling a Market Resource

The following are the general guidelines in modelling the different *market resources*:

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6.4.4 xxx xxx xxx

6.5 Generator Market Resource

6.5.1   During the registration of the generator resource, the *Trading Participant* shall specify if the *scheduling point* should represent the gross MW output of the generator or at the same location as the *market trading node*, which is at the connection point and net of its station use. The location of the *scheduling point*

shall be the reference point for the *registered capacity*, submission of *generation offers* and self-scheduled nominations, scheduling, dispatch, and dispatch compliance monitoring.

6.5.2   During the submission of offers to supply electricity, the participant generator shall specify the location of the connection point and the relevant market network *node*.

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6.6 Customer Market Resource

6.6.1   Should there be limitations for a customer resource to be modelled at the *connection point* (e.g. availability of real-time monitoring facilities), the *Market Operator* may implement simplifications and approximations to its representation in the *market network model* while still ensuring its consistency and accuracy with its actual connection to the grid.

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6.7 Battery Energy Storage System Market Resource

6.7.1   During the registration of the *battery energy storage system resource*, the *Trading Participant* shall specify if the *scheduling point* should represent the gross MW output of the generator or at the same location as the *market trading node*, which is at the connection point and net of its station use. The location of the *scheduling point* shall be the reference point for the *registered capacity*, submission of *generation offers* and self-scheduled nominations, scheduling, dispatch, and dispatch compliance monitoring.

6.7.2   The information that should be submitted by the generators in their energy supply and reserve *offers* are enumerated in Appendix A1.4 of the WESM Rules.

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6.8 Pumped-storage Unit Market Resource

6.8.1   During the registration of the *pumped-storage unit* resource, the *Trading Participant* shall specify if the *scheduling point* should represent the gross MW output of the generator or at the same location as the *market trading node* (i.e. at the *connection point*, which is at the connection point and net of its station use. The location of the *scheduling point* shall be the reference point for the *registered capacity*, submission of *generation offers* and self-scheduled nominations, scheduling, dispatch, and dispatch compliance monitoring.

6.8.2 The information that should be submitted by the generators in their energy supply and reserve *offers* are enumerated in Appendix A1.1 of the WESM Rules.

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6.9 Procedure for Registration of Market Resources

6.9.1 xxx xxx xxx

6.9.2 The Market Operator and the System Operator, in coordination with the Trading Participant, shall determine the *market resource* model based on the guidelines of Section 6 of this document. The agreed *market resource* model shall be determined in accordance with the procedures under the *WESM Market Manual* on Registration, Suspension, and De-Registration Criteria and Procedures.

Section 4. Separability Clause. If for any reason, any section or provision of this Circular is declared unconstitutional or invalid, such parts not affected shall remain valid and subsisting.

Section 5. Repealing Clause. Except insofar as may be manifestly inconsistent herewith, nothing in this Circular shall be construed as to repeal any mechanisms already existing or responsibilities already provided for under existing rules.

Section 6. Effectivity. This Circular shall take effect fifteen (15) days following its complete publication in at least two (2) newspapers of general circulation and shall remain in effect until otherwise revoked. Copies thereof shall be filed with the University of the Philippines Law Center – Office of National Administrative Register (UPLC-ONAR).

Issued on _____ 2022 at the Energy Center, Rizal Drive, Bonifacio Global City, Taguig City, Metro Manila.

ALFONSO G. CUSI
Secretary