**Republic of the Philippines**
**DEPARTMENT OF ENERGY**
**(Kagawaran ng Enerhiya)**

DEPARTMENT CIRCULAR NO. _DC2023-01-0001_

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

**WHEREAS**, Sections 30 and 37(f) of Republic Act No. 9136 or the Electric Power Industry Reform Act (EPIRA) of 2001 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 Philippine Electricity Market (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 26 May 2022, the proposal was posted on the DOE website to solicit comments from the stakeholders and other interested parties;

**WHEREAS**, the DOE conducted the following Virtual Public Consultations to present the proposal:

| Leg | Date | Venue |
|---|---|---|
| Visayas | 08 June 2022 | Cebu City |
| Luzon | 21 June 2022 | Taguig City |
| Mindanao | 20 July 2022 | Cagayan de Oro City |

**NOW THEREFORE**, after careful review of the PEM Board-approved proposal and the comments and recommendations 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 the 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:

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.

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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:

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.

*xxx xxx xxx*

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* Resources

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* Resources

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

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### 4.6.3 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

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### 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* shall determine nodal load forecasts for loads with no real-time information based on the different approaches listed in the WESM Manual on Load Forecasting (*see Appendix B*).

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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5.10 Continuing Obligations and Responsibilities

5.10.1 xxx xxx xxx

5.10.2 The *System Operator* and *Trading Participants*, in coordination with *Network Service Providers* 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 *Market Operator* in coordination with the *System Operator* and *Trading Participant* 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

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6.1.2 One *market resource* may be defined to represent both the *scheduling point* and the *market trading node.*

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### 6.3 Types of Market Resources

6.3.1 Market Resources can be classified as:

a) 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.

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

c) 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.

d) 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 MTN and *scheduling points* shall be defined in a manner that calculation of relevant power flows and locational marginal prices shall not result to cross-subsidization of the *Trading Participant*.

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

6.5.3 During the registration of the generator resource, *Trading Participants* shall specify if its availability shall be based on the real-time status of its generator breaker, or on the availability of its *market offers*.

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.

6.7.3 During the registration of the *battery energy storage system resource*, *Trading Participant*s shall specify if its availability shall be based on the real-time status of its connecting breaker, or on the availability of its *market offers*.

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.

6.8.3 During the registration of the *pumped-storage unit* resource, *Trading Participant*s shall specify if its availability shall be based on the real-time status of its connecting breaker, or on the availability of its *market offers*.

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.

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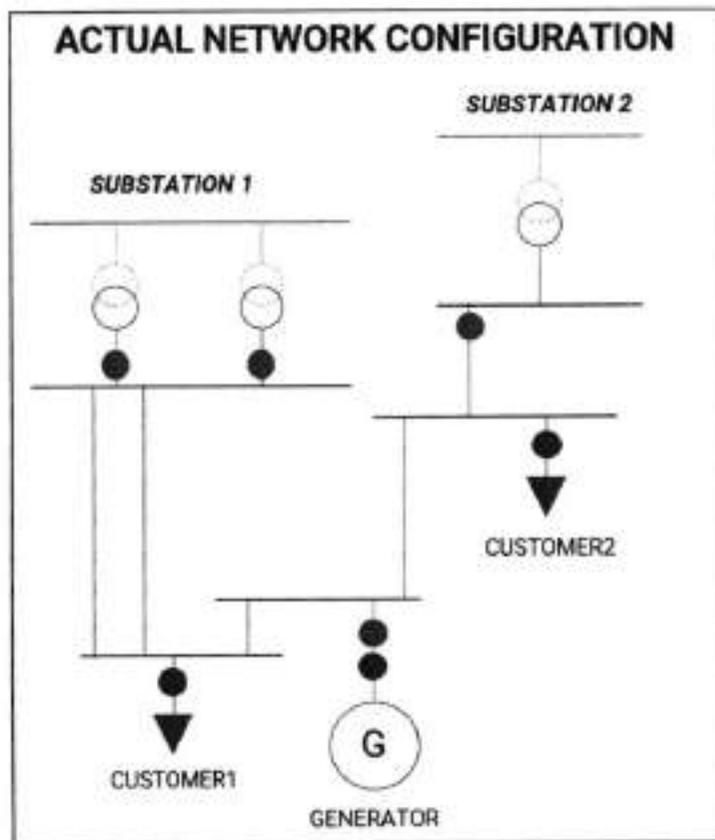
**Section 6. Effectivity.** This Circular shall take effect fifteen (15) days following its complete publication in at least two (2) newspapers of general circulation and shall remain in effect until otherwise revoked. Copies thereof shall be filed with the University of the Philippines Law Center –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

Issued on 11 January 2023 at the DOE, Energy Center, Rizal Drive cor. 34th St., Bonifacio Global City, Taguig City, Metro Manila.
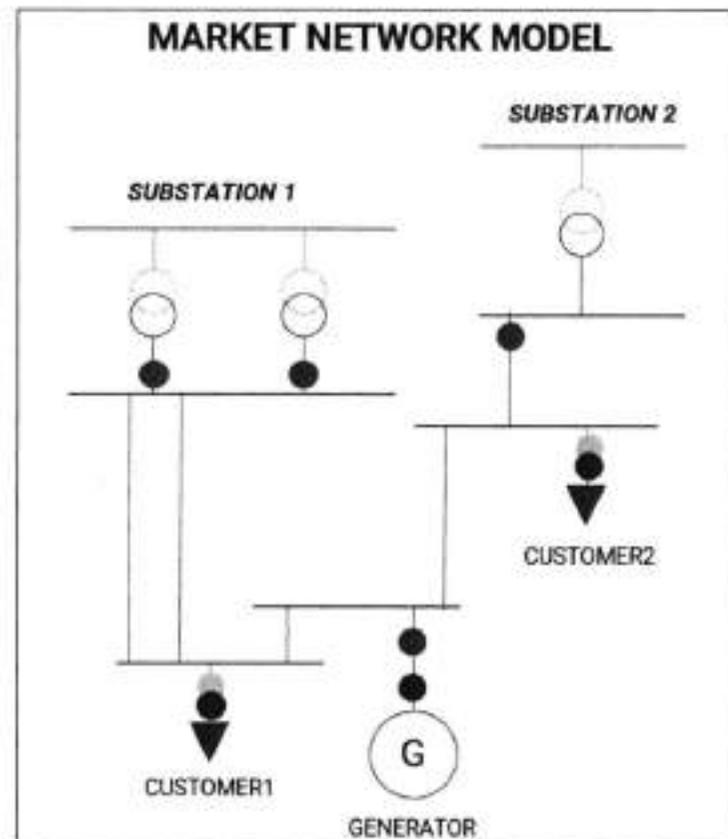
**RAPHAEL P.M. LOTILLA**
Secretary

**Appendix B.** Illustration of Simplified Model for Embedded Generators



ACTUAL NETWORK CONFIGURATION

SUBSTATION 2

SUBSTATION 1

CUSTOMER2

CUSTOMER1

GENERATOR

G

● REAL-TIME MONITORING    ● REVENUE METER

MARKET NETWORK MODEL

SUBSTATION 2

SUBSTATION 1

CUSTOMER2

CUSTOMER1

GENERATOR

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● REAL-TIME MONITORING    ● REVENUE METER
● ESTIMATED REAL-TIME DATA