



Demand-Side Bidding in the WESM

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This Report is prepared by the
WESM Technical Committee

EXECUTIVE SUMMARY

Demand-Side Bidding (DSB) is a mechanism that enables consumers to actively participate in electricity trading, by bidding or pricing their energy demand block to match the generators' offers¹. The integration of customer's bid price to the market optimization model will promote higher level of competition and provide more accurate price signals. Currently, the WESM Rules² allows customer with dispatchable load to submit a standing demand bid on a voluntary basis.

As part of its task to review technical matters in the WESM, the WESM Technical Committee (TC), with the assistance of the PEMC-Corporate Planning & Communications Department, initiated a consultation with participants on DSB and its implementation in the WESM. This effort is also in compliance with the Energy Regulatory Commission's (ERC) directive for PEMC to study or conduct a survey on the customers' awareness of, interest in, and preparedness for DSB.

Based on the results of the consultation, majority of the respondents claimed basic to no knowledge on DSB, including its benefits and risks. Still, some respondents recognized that customers may gain benefits from this market feature if policies and rules on the participation in DSB are properly laid out.

Currently, no one from WESM participants has participated in DSB by submitting customer demand bids. This can be attributed to the lack of knowledge and inadequate policies on the implementation of DSB in the WESM.

In view of the foregoing, the TC recommends for PEMC to conduct the following activities to promote and encourage participation in DSB in the WESM even if it is still voluntary:

1. In coordination and consultation with the Department of Energy (DOE), ERC, Independent Electricity Market Operator of the Philippines (IEMOP), and stakeholders, propose rules on DSB implementation including among others rules related to cost implications, incentives, and penalties for non-compliance.
2. Conduct trainings, information education campaigns, and other related activities to raise participants' awareness on DSB; and

As industry stakeholders, particularly Customers, slowly learn and appreciate the benefits of DSB and encouraged with good WESM governance, participation will gain traction, while still voluntary.

¹ Green, R. Hull, L., A Practical Guide to Demand-Side Bidding, International Energy Agency Demand-Side Management Programme, 2003

² Section 3.5.6.1, WESM Rules, November 2020

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1.0 Introduction

1.1 Background

Demand-Side Bidding (DSB) is a mechanism that enables consumers to actively participate in electricity trading, by bidding or pricing their energy demand block to match the generators offers.³ In most electricity markets, customers are usually passive trading participants wherein they buy electricity at the price of the last generator necessary to serve the demand.

Compared to supply that can respond to market results and is able to actively participate in the determination of prices in electricity markets through the submission of offers, demand for electricity is mostly an inflexible variable⁴. Since use of electricity is a necessity in the modern world, most loads are not geared towards flexibility; hence, demand systems are not designed to have the ability to respond to market pricing signals. However, customers can creatively manage their demand by using storage devices, establishing own/distributed generation, and implementing time-shift loads, among others. By effectively managing their demand, these customers may benefit from their participation in DSB. Some of the benefits that the customers may gain from DSB is presented in the next section.

1.2. Purpose of the Document

This document aims to:

1. Provide information and background on DSB;
2. Present the results of the TC consultation survey on DSB in the WESM; and
3. Provide recommendations on the implementation of DSB in the WESM based on the results of the TC consultation.

This paper is in line with the Energy Regulatory Commission's (ERC) directive for PEMC to study or conduct a survey on the customers' awareness of, interest in, and preparedness for demand-side bidding⁵

2.0 Demand-Side Bidding

2.1 Benefits of Demand-Side Bidding

According to a paper by the U.S. Department of Energy (DOE)⁶, benefits from demand response, which includes DSB, may be grouped into four (4). These are:

1. Participant financial benefits
This refers to the individual cost savings of loads that participate in demand response programs. By declaring the maximum price that the load is willing to purchase electricity, the load will not be

³ Green, R. Hull, L., A Practical Guide to Demand-Side Bidding, International Energy Agency Demand-Side Management Programme, 2003

⁴ Dela Vina, J., Cacho I.E., Descanzo, R.P., Demand-Side Bidding Implementation Assessment, PEMC, December 2016

⁵ ERC Case No. 2017-042 RC, December 2020, page 245

⁶ Benefits of Demand Response in Electricity Markets and Recommendations for Achieving Them. Department of Energy of the United States of America. 2006. http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/DOE_Benefits_of_Demand_Response_in_Electricity_Markets_and_Recommendations_for_Achieving_Them_Report_to_Congress.pdf

scheduled to consume during times when the electricity prices are too high and would avoid the high electricity costs.

2. Market-wide financial benefits

This refers to the lower wholesale spot market prices paid by all trading participants as a result of lower utilization of more expensive power plants that would have been dispatched to serve the load of the demand response participants.

3. Market performance benefits

This refers to the ability of demand response to mitigate the ability of suppliers to exercise market power by providing an opposing market force that limits the prices in the wholesale spot market.

4. Reliability benefits

This refers to the load-side adjustments that could be provided by demand response participants during contingency events, which lowers the possibility of involuntary load curtailment.

Among the abovementioned benefits, market-wide financial benefits and market performance benefits directly apply to DSB. The market-wide benefit may be illustrated in Figure 1. In the figure, Loads D to F were curtailed since the wholesale price is higher than the maximum price of these loads and have avoided the higher electricity costs. However, due to their curtailment, the wholesale price was set at a lower rate (P_2) relative to the rate (P_1) without the curtailment of those demand-side bidding participants. As a result, Loads A to C would only be paying at the lower wholesale price (P_2) and would benefit from the actions of the demand-side bidding participants even if they themselves did not curtail any demand. The green-shaded area in Figure 1 represents the total benefit of the market due to the actions of the DSB participants.

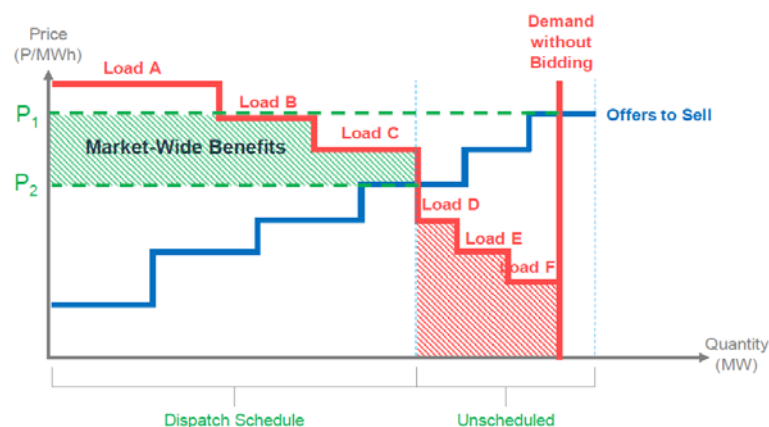


Figure 1 Market-Wide Benefits of DSB⁷

Figure 2 provides an example of the market performance benefits of DSB. In the figure, the generators submitted higher offers to sell (solid blue to shaded blue). In both cases (i.e., with DSB and without DSB), the higher generation offers would result in higher wholesale prices. It may be observed, however, that the increase in price is less significant when there is DSB (P_3 to P_4) compared with when there is no DSB (P_1 to P_2). This illustrates how DSB may temper the impact of supply-side movements on the wholesale prices.

⁷ Dela Vina, Cacho, Descanzo, Demand-Side Bidding, 2.

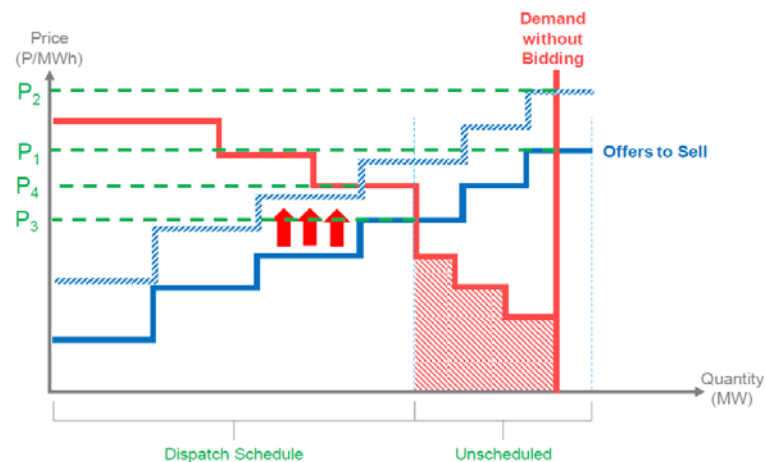


Figure 2 Market Performance Benefits of DSB⁸

Reliability benefits improves the welfare of the industry. During situations of thin supply, similar to the current situation in the Luzon grid, DSB encourages voluntary demand curtailment. By shifting loads or agreeing to short-term interruptions to their supply, consumers can help ensure a balance between electricity supply and demand and maintain the quality and security of electricity supply⁹.

2.2 Demand-side Bidding in the WESM

Since DSB refers to the active participation of customers in the determination of real-time electricity prices, the current rules¹⁰ specifies that customers¹¹ may participate in the WESM by submitting a standing demand bid in respect of each trading interval for each of its registered scheduled load facilities for each trading day of the week in accordance with the timetable.

The WESM Rules specified the following qualified entities to register as Customer¹² for them to submit their demand bids–

1. Distribution Utilities (e.g. Private Distribution Utilities, Electric Cooperatives)
2. Retail Electricity Suppliers
3. Bulk Users or End Users that are withdrawing electricity from the transmission system or from the distribution system which are permitted to trade in the WESM

Price Determination Methodology Clause 2.4 also states that Customers or loads that are classified as dispatchable loads may submit a maximum proportion of the forecasted/scheduled load which may be interrupted. Dispatchable loads shall submit offers considering the following:

- At most, ten (10) energy offer blocks per take-off point
- Minimum block size of one (1) MW
- Monotonically decreasing prices per block
- Validity period of bids.

⁸ Dela Vina, Cacho, Descanzo, Demand-Side Bidding, 2.

⁹ Green, Hull, Guide to Demand-Side Bidding, 2.

¹⁰ Section 3.5.6, WESM Rules, November 2020

¹¹ A person or an entity that engages in the activity of purchasing electricity supplied through the transmission system or a distribution system to a connection point may register with the Market Operator as a Customer.

¹² Section 2.5.1.2, WESM Manual on Registration, Suspension and De-registration Criteria and Procedures Issue 5.3, November 2020

The WESM Rules have also incorporated general provisions on DSB in the pricing and scheduling process, market projections, and dispatch and settlement processes for scheduled loads. Annex B provides a list of relevant provisions in the WESM Rules and Market Manuals in relation to DSB.

2.3 Demand-side Bidding Participants

Customers registered in the WESM are classified based on the following customer types:

1. Directly Connected Customer (DCC)
2. Electric Cooperative (EC)
3. Private Distribution Utility (PDU)
4. Retail Electricity Supplier (RES)
5. Contestable Customers (CC)

Among the abovementioned customers, DCCs and CCs may have the most potential benefit when they participate in DSB. since these two generally have direct control over their demand requirements and may have the ability to respond to market signals given sufficient lead time.

CCs are defined in the Retail Rules as electricity end-users that are certified by the ERC to have met the demand threshold for contestability. To date, the threshold for voluntary contestability is 500kW¹³. Majority of the CCs are indirect members in the WESM. For the CCs to participate in DSB, they may need to register as direct members in the WESM or course their participation through their counterparty Retail Electricity Suppliers.

For the rest of the customer types (i.e., PDUs, ECs), additional guidelines may need to be established for their participation in DSB since compliance to curtailment schedules would have to be performed by their customers. Since their end-users are the ones foregoing economic activities, the rules for curtailment should ensure that customer who curtailed would receive the benefits of their curtailment and their businesses/ economic activities were not disrupted.

3.0 Consultation on Demand-Side Bidding in the WESM

As part of the TC's 2021 work plan and in compliance with the ERC directive, TC conducted a consultation to gather information from the following stakeholders on their interest and preparedness for the possible implementation of DSB in the WESM:

1. Private Distribution Utilities,
2. Electric Cooperatives,
3. Retail Electricity Suppliers,
4. Directly Connected Customers, and
5. Contestable Customers

3.1 Consultation Participants

A survey via an online form was sent to direct and indirect WESM Members, to participate in the consultation. The consultation was conducted on 23 March 2021. By 30 April 2021, 54 responses were gathered from companies as follows:

¹³ Resolution No. 12 Series of 2020, Energy Regulatory Commission (ERC), December 2020

Membership Category	No. of Companies
PDU	11
EC	16
RES	19
DCC	3
CC	5
Total	54

3.2 Results of the Consultation

Participants' Level of Knowledge

To determine the awareness of the participants on DSB, its benefits and corresponding processes in the WESM, the participants were asked on their level of knowledge on various categories. Based on the results, majority of the respondents claimed basic to no knowledge on DSB. Figure 3 shows the percentage of participants' level of knowledge on DSB per category. However, those who claimed intermediate and advanced knowledge provided important insights for possible DSB in the WESM.

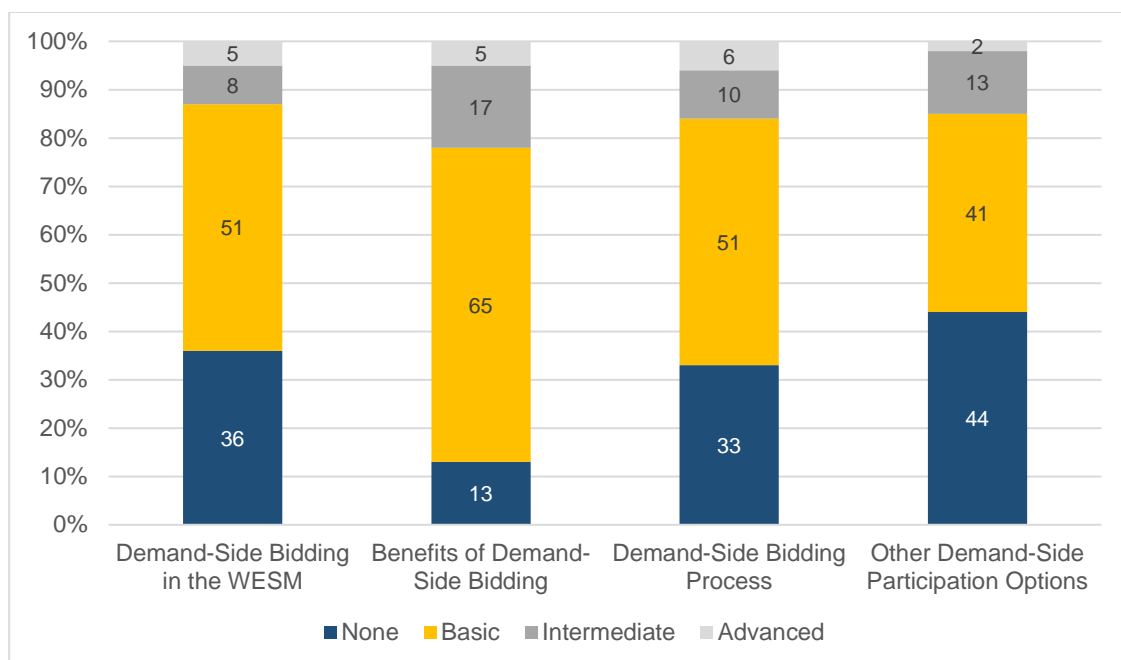


Figure 3. Participants' Level of Knowledge on DSB

Responses to Consultation Questions

Aside from the level of knowledge, the participants' insights and responses on various questions were also asked to gauge their interest and preparedness on DSB. Table 1 summarizes the responses received on various DSB topics. (See Annex A for a copy of the TC consultation survey)

Table 1. Responses to TC Questions on Various Topics

Topic	Responses
Possible Benefits with the Implementation of DSB in the WESM	The integration of [load] customer's bid price to the market optimization model will promote higher level of competition. Hence, cheaper or reduced rate since the real marginal price is achieved.
	The proper supply-demand equilibrium can now be satisfied
	On suppliers' point of view, they will have a better idea on the actual demand profile of their customers
	It will attract development and improvements in the system where the load customers will be able to actively participate in the energy markets.
Perceived Challenges with the Implementation of DSB in the WESM	Additional manpower and infrastructure are required since this will require 24/7 monitoring
	Lack of customers' trading knowledge and experience which will affect the accuracy of the forecasting of their demand requirement.
	Information dissemination to the facilities which may be qualified to be demand response participants.
	Ensuring compliance of loads participating in the DSB. This may result to an increase in the utilization of ancillary services if not strictly enforced
	The presence of offer cap and price cap will make the DSB less attractive.
	Unfamiliarity with the consequences when demand bids are not cleared in the market – curtailment or financial penalty.
Recommendations to Revise the existing Market Rules and Manuals	There are insufficient provisions to address cases where CC participating in DSB is also being supplied by a RES.
	Integration of market network models of all DUs and ECs in the MMS/NMMS.
	The improvement of the RTU and its redundancy system that can be provided under MSP will ensure accuracy and reliability of data since the network is complex by its nature.
	Registration should be voluntary and only to those that have the capacity to curtail load will have the reason to join this new market feature.
	Timeline and per phased implementation of DSB to incorporate readiness of the participants
	Details of the implementation of DSB (i.e. cost impact, pricing schemes)

With regard to the incentives and benefits for companies who will participate in DSB, Table 2 provides the suggestions provided by survey respondents:

Table 2. Suggested incentives and benefits for DSB participants

	Responses
1	Electricity rate reduction and lower rate for operation charges
2	Fix price discount for every energy bought
3	Flexibility in bidding strategies
4	No power interruptions and downtime regardless of time and season
5	Capital Expenditures subsidies (e.g. RTU devices ad system)
6	Customers' entitlement to Net Settlement Surplus (NSS)
7	Market Fees shared among all participants
8	Tax incentives
9	Removal of the Security Deposit requirement to IEMOP
10	Incentives in maintaining the contracted reduction or "minimum energy-reduced" over a period of time
11	No registration fees and easier requirements for DSB participants
12	Preferential Rate for the reduced demand
13	DUs may be allowed to retain a portion of the savings from DSB as funds for the additional CAPEX and OPEX to support changes in customer behavior

In addition, the participants were asked on possible alternatives to DSB in the WESM that may produce comparable benefits, Table 4 provides a list of suggested alternatives from the respondents:

Table 3. Suggested alternatives to DSB

	Suggested Alternatives
1	Financial Markets (Contract for difference and multi-party forward trading)
2	Auctioning offers and the opening of secondary markets
3	Power Supply Contracts Auctions
4	Direct procurement
5	Allow companies to explore putting up renewable sources of energy without limitations by the DU
6	Portfolio optimization
7	Allow DUs to utilize Demand Response ("DR") Program during instances of high wholesale spot market prices or for purposes of peak shaving.
8	Market-tied compensation for DU Load-shedding. Automatic Load Dropping (ALD)/Manual Load Dropping (MLD) is beneficial to maintain system balance. In practice, the SO uses ALD as a substitute for fast acting contingency reserve. It is effectively on standby and can be readily called upon to immediately respond in accordance with parameters agreed between SO and the DU. Hence, compensation for ALD and MLD participants should also be established. These rewards can be shared with customers through reduced rates.
9	Encourage customers to maintain a constant load curve. DU benefits from DSB in terms of a flatter load curve and peak demand reduction that improves the loading condition of the involved facilities in the long term. Customers can be encouraged to maintain a constant load curve through incentives or rewards.
10	Demand Side Management (DSM) is an alternative as this likewise encourages load reduction or other long-term changes to consumption patterns. DSM is embodied in the Energy Efficiency and Conservation Act (Republic Act No. 11285).
11	Allowing load customers to participate in the Reserves Market as Interruptible Loads may also produce similar gains.

4.0 Survey Results Analysis and Recommendations

The TC recognizes that DSB is a feature of the WESM that is already integrated in the New Market Management System (NMMS). In fact, this feature is available in the current MMS which has been in place since 2006. Also, there are general provisions in the WESM Rules and Market Manuals specifying that DSB is accommodated in the WESM. However, based on the available data from the Independent Electricity Market Operator of the Philippines (IEMOP), no Customer has submitted any demand bid in the WESM as of date. In fact, no Customer has registered its Capability, including its Projected Maximum load, which are requirements for them to submit demand bids.

Non-participation in DSB may be attributed to the participants' lack of knowledge on this market feature. Also, there are no policies and procedures in place at the moment which provide further details to promote participation in DSB. This is based on the responses of participants to the TC consultation.

With this, the TC recognized that there are actions that need to be undertaken to encourage the participation in DSB and ensure that this market feature benefits Customers and the market in general. Hence, the TC recommends the following:

1. Set clear framework and policies on DSB participation considering cost implications, possible incentives and corresponding penalties for non-compliance. Internal audit on DSB is recommended

The TC is in the opinion that DSB benefits will only be realized with wider participation, which is towards making it mandatory instead of the current regime of voluntary participation. However, making this mandatory would require rigorous industry-wide discussions and ensuring that systems are ready.

A separate Market Manual on DSB may also be developed to define the requirements, responsibilities, processes required for the implementation of this market feature. This may be realized by fleshing out details on DSB and possibly conducting an audit on the current rules and process to identify possible gaps that may impede participation.

Furthermore, cost implications on DSB appears to be the main source of apprehension for market participants. For example, will there be cost implications when demand bids are not cleared, and when there is supply constraints, etc. Aside from penalties, incentives may also be established for the customer participation.




2. Conduct trainings, information, education, and communication campaign (IEC), and other related activities to raise the participant awareness on demand-side bidding.

Based on the survey responses, most of the respondents only have basic or little knowledge on the benefits of demand-side bidding and various demand-side bidding related matters.

To raise awareness and equip the participants with healthy understanding of the DSB, IECs targeting the DUs, ECS, CCs and large consumers can be spearheaded by PEMC to encourage industry-wide discussions on DSB in the WESM.

As industry stakeholders, particularly Customers, slowly learn and appreciate the benefits of DSB and encouraged with good WESM governance, participation will gain traction, while still voluntary.

Submitted by:
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ANNEX A: Consultation Survey Questions

TECHNICAL COMMITTEE CONSULTATION ON DEMAND-SIDE BIDDING IN THE WESM

1. Introduction

Demand-side bidding refers to the active participation of customers in the determination of real-time electricity prices through submission of bids to buy electricity at corresponding maximum prices. But in most electricity markets, customers are usually passive trading participants where they buy electricity at the price of the last generator necessary to serve the demand.

To come up with a proposed framework on demand-side participation, specifically demand-side bidding and as applicable, rules change to implement this new market feature, the WESM Technical Committee (TC) is conducting an online consultation using Microsoft Forms. Also, the Philippine Electricity Market Corporation (PEMC) prepared a consultation paper to come along with this questionnaire to provide information and background on demand-side bidding.

2. Purpose

In line with the ERC's directive to provide a review on the interest and preparedness of participants on demand-side bidding, the TC prepared this consultation questionnaire to gather information from concerned stakeholders on the subject matter.

Responses gathered from the consultation paper will also serve as inputs to the TC's position paper on demand-side bidding, which is part of their 2021 work plan.

3. Intended Respondents: WESM Members - Private Distribution Utilities, Electric Cooperatives. Retail Electricity Suppliers, Directly Connected Customers and Contestable Customers (One response per WESM Member)

4. Confidentiality

It is understood that in accomplishing this form, the undersigned representative of the WESM Member organization has read the provisions of Republic Act No. 10173 otherwise known as the Data Privacy Act of 2012 and its corresponding Implementing Rules and Regulations and hereby affirms its rights pursuant to said law.

By voluntarily supplying the information stated herein, the undersigned WESM Member expresses consent for the WESM TC, PEMC, PEM Board of Directors, and their authorized personnel, to collect, record, use, organize, update or modify, retrieve, consult, consolidate, process, or otherwise erase or destruct personal data or any other confidential information gathered for the purpose/s stated herein, with the obligation to warrant and maintain the confidentiality of the survey information and prevent its unauthorized use, processing and disclosure subject to the exceptions herein stated.

Survey Form

Instruction: Kindly accomplish the survey via Microsoft Forms or using the attached form and submit it via email to cpc-sai@wesm.ph.

Name:	Position :
Company Name:	
<p>WESM Membership Information: <i>Please put an X to the appropriate box.</i></p> <p>A. WESM Member Category</p> <p><input type="checkbox"/> Private Distribution Utilities</p> <p><input type="checkbox"/> Electric Cooperatives</p> <p><input type="checkbox"/> Retail Electricity Suppliers</p> <p><input type="checkbox"/> Directly Connected Customers</p> <p><input type="checkbox"/> Contestable Customers</p> <p><input type="checkbox"/> Wholesale Aggregator</p> <p>B. Membership Type</p> <p><input type="checkbox"/> Direct Member</p> <p><input type="checkbox"/> Indirect Member</p>	

A. Level of Knowledge

Please indicate your level of knowledge for each category.

Instruction: Please put an X in the appropriate knowledge level box.

Category	Knowledge Level				Comments
	None	Basic	Intermediate	Advanced	
Benefits of Demand-Side Bidding					
Demand-Side Bidding Processes					
Demand-Side Bidding in the WESM based on the current rules					
Other Demand-Side Participation Options					

B. Readiness and Insights on Demand-Side Bidding

1. What specific benefits do you think your company will gain if demand-side bidding is activated in the WESM?

2. What do you think are the challenges that your company may experience with the implementation of demand-side bidding in the WESM?

3. Based on existing rules presented in the consultation paper, do you have any recommendation to revise or remove any provision to improve participation of concerned stakeholders on demand-side bidding in the WESM?

4. If you were to suggest incentives and benefits for companies who will participate in demand-side bidding, what would that be?

5. What do you think are alternatives to demand-side bidding that may produce similar gains or may be beneficial to your company?

C. General Comment/Suggestions

Please write other comments and suggestions on the implementation of demand-side bidding in the Philippines, if there are any.

Thank you for your inputs.

WESM TECHNICAL COMMITTEE

ANNEX B: Demand-Side Bidding Provisions in the WESM Rules and Market Manuals

1. WESM RULES, November 2020

2.3.2 Customer

2.3.2.1 A person or an entity that engages in the activity of purchasing electricity supplied through the transmission system or a distribution System to a connection point may register with the Market Operator as a Customer.

2.3.2.2 To register as a Customer, a person or an entity shall satisfy the membership criteria specified in clause 2.3.3.4.

2.3.2.3 A Customer shall comply with the scheduling and dispatch procedures described in chapter 3.

2.3.2.4 A Customer shall register each of its connection points with the Market Operator. For each Contestable Customer, all connection points shall be registered under the same Contestable Customer.

3.5.4 Load Forecasting

All load forecasts at each market trading node in the market network model shall be specified in units of megawatt (MW) and will apply to the end of the relevant dispatch interval unless otherwise stated.

3.5.4.1 Each Customer may submit a forecast in respect of each dispatch interval for each of its registered load facilities for each trading day of week in accordance with the timetable. The forecast submitted by the Customer shall be used by the Market Operator in the preparation of Net Load Forecast.

If the Customer fails to submit a forecast of his load facilities in accordance with the timetable, the forecast prepared by the Market Operator at the scheduling point where the Customer is located shall be used.

3.5.4.2 Each net load forecast shall be prepared in such a way as to represent the net load to be met by generation from scheduled generating units, must dispatch generating units, priority dispatch generating units, non-scheduled generating units, battery energy storage systems and pumped-storage units including losses occurring outside the system represented by the market network model, but excluding any scheduled load.

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3.5.6 Customer Demand Bids

3.5.6.1 Each Customer may submit a standing demand bid in respect of each trading interval for each of its registered scheduled load facilities for each trading day of the week in accordance with the timetable.

3.5.6.2 Each demand bid submitted under clause 3.5.6.1 shall:

- a) Correspond to load which has been certified as dispatchable, in accordance with the Grid Code and Distribution Code; and
- b) Include the information specified in Appendix A1.3 in the WESM Rules.

3.5.6.3 Each Customer shall, in consultation with the System operator, submit check data for each of its registered scheduled load facilities to be used by the Market Operator in accordance with clause 3.5.12, to assist in determining the validity of any demand bid which it may submit.

Annex A1.3: Demand Bids

- a) Shall have up to 10 bid blocks per take-off point;
- b) Shall have a minimum block size of one (1) MW;
- c) Shall have monotonically decreasing prices;
- d) Shall start from a zero offtake;
- e) May have bid prices that are negative; and
- f) Shall include a validity period of bids.

3.5.9 Revision of Standing Offers/Bids

3.5.9.1 A standing generation offer, a standing reserve offer, a standing nomination of loading levels, a standing projected output, or a standing demand bid for any trading interval in any day of the week may be revised by the relevant Generation Company or Customer in accordance with the timetable.

3.5.9.2 A standing generation offer, a standing reserve offer, a standing nomination of loading levels, a standing projected output, or a standing demand bid which is revised under Clause 3.5.9.1:

- a) Shall take effect the next time a week ahead projection is initiated, in accordance with the timetable; and
- b) Shall only affect the offers employed in market dispatch optimization model runs used to determine projections, dispatch, or pricing for periods not already covered by week-ahead projections which have already been published, or whose preparation has already been initiated at the time when the revised offer or bid is accepted.

3.5.12 Confirmation of Receipt of Valid Offers, Bids, Nomination of Loading Levels, and Projected Outputs

3.5.12.1 To be valid, generation offers, reserve offers, nomination of loading levels, projected outputs or demand bids shall be submitted by the relevant Trading Participant:

- a) in accordance with Clause 3.5.1;
- b) in accordance with the timetable; and
- c) consistent with the check data submitted by the Trading Participant under Clauses 3.5.5.3, 3.5.5.7, 3.5.6.3, and 3.5.7.4 as appropriate.

3.5.12.2 The Market Operator shall send to each Trading Participant from whom it has received a valid generation offer, valid nomination of loading level, valid reserve offer, valid demand bid or valid projected output, an electronic confirmation of receipt and acceptance of that generation offer, nomination of loading level, reserve offer, demand bid or projected output in accordance with the timetable prescribed in the relevant Market Manuals.

3.5.12.3 If a Trading Participant does not receive confirmation of receipt under Clause 3.5.12.2, from the Market Operator, the Trading Participant shall contact the Market Operator to determine whether or not the generation offer, nomination of loading level, reserve offer, demand bid, or projected output was received.

3.5.12.4 If the generation offer, reserve offer, demand bid, or projected output is invalid, the Market Operator shall promptly inform the Trading Participant to resubmit a corrected generation offer, reserve offer, demand bid or projected output in accordance with Clause 3.5.11.

3.6 Market Dispatch Optimization Model

3.6.1.3 The objective of the market dispatch optimization model shall be to maximize the value of dispatched load based on dispatch bids, minus:

- (a) The cost of dispatched generation based on dispatched offers;
- (b) The cost of dispatched reserves based on reserves contracted for or when applicable reserve offers; and
- (c) The cost of constraint violation

3.6.1.4 In formulating the market dispatch optimization model, the Market Operator and System Operator shall ensure that the dispatch for each trading interval is made subject to:

- a) Constraints representing limits on generation offers, demand bids, nomination of loading levels, projected outputs, and, when applicable, reserve offers as specified by Trading Participants in accordance with Clause 3.5, except to the extent that as they may be relaxed in accordance with Clause 3.5.13;

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3.6.1.5 The market dispatch optimization model shall be designed so that, subject to the approximations and adjustments provided for by Clause 3.6.4:

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- c) It will produce energy prices for each market trading node, and when applicable reserve price for each reserve region, so that the recommended dispatch targets for each individual Trading Participant would be optimal for that participant at those prices, given their offers and demand bids and after accounting for other constraints which may affect that Trading Participant, and

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3.7.4 Preparation of Market Projections

3.7.4.1 Each market projection shall take into account:

- (a) The network service provider data prepared in accordance with clause 3.5.2;
- (b) Reserve requirements, the anticipated market network model configuration, constraints and system security requirements for each reserve region, as advised by the System operator in accordance with clause 3.5.3;
- (c) The forecast demand information prepared in accordance with clause 3.5.4;
- (d) The market offer information submitted by each relevant Trading Participant in accordance with clause 3.5.5;
- (e) The nomination of loading levels for each non-scheduled generating unit and the projected output for each must dispatch generating unit and priority dispatch generating units submitted under Clause 3.5.5; and
- (f) When applicable, the reserve offer information submitted by each relevant Trading Participant in accordance with clause 3.5.7 and 3.5.8.

3.7.5 Published Information

3.7.5.1 Based on the information referred to in Clause 3.7.4, each *market projection published* by the *Market Operator* in accordance with the *timetable* specified in the relevant *Market Manuals* shall contain the following information for each *dispatch interval* or one (1) hour interval, as applicable, in the period covered by the *market projection*:

xx

- (d) Projected aggregate dispatch of *scheduled generating units, must dispatch generating units, priority dispatch generating units, non-scheduled generating units, and scheduled load* at each *scheduling point*;

Xx

3.8.5 Dispatch Conformance Standards

3.8.5.1 The Market Operator, in consultation with the System Operator and Trading Participants, shall develop dispatch conformance standards to be set forth in the relevant Market Manual which shall be consistent with the Grid Code and Distribution Code.

3.8.5.2 The Market Manual under Clause 3.8.5.1 shall set out the following:

- (a) dispatch conformance standards that will apply to generating units and to scheduled load facilities;
- (b) procedures for monitoring and notifying Trading Participants of the non-compliance by their generating units with their dispatch schedules; and
- (c) Procedures for identifying and checking non-conformance with the dispatch conformance standards taking into consideration any ancillary service schedule, ancillary service responses, or emergency directions issued to dispatched Trading Participants.

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3.8.6 Sanctions of Trading Participants

Any Trading Participant that (a) does not comply with the dispatch conformance standards or (b) consistently fails to use its reasonable endeavors to comply with the dispatch instructions issued by the System Operator under Clauses 3.8.3, 6.3 and 6.5, may be liable of a sanction imposed under Clause 7.2.

3.11.1 Market Information

3.11.1.3 Each *trading day*, in accordance with the *timetable*, the *Market Operator* shall *publish*:

- (a) The *dispatch schedule* for each *scheduled generating unit, battery energy storage system, pumped-storage unit, must dispatch generating unit, priority dispatch generating unit, non-scheduled generating unit* and *scheduled load* in each *dispatch interval* in the *settlement intervals* for the previous *trading day*; and

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2. WESM MANUAL ON REGISTRATION, SUSPENSION AND DE-REGISTRATION CRITERIA AND PROCEDURES ISSUE 5.3, November 2020

2.5.1.2 Customers

- a) A person or entity that engages in the activity of purchasing electricity supplied through the transmission system or the distribution system to a connection point may register with the Market Operator as a Customer.
- b) The following are qualified to register as Customer –

- Distribution Utilities, including private distribution utilities, electric cooperatives and local government utilities undertaking distribution of electricity.
 - Retail Electricity Suppliers that have been authorized to engage in retail electricity supply by the ERC, provided, however, that the RES may only register in the WESM upon declaration of retail competition and open access by and shall transact in the WESM and subject to relevant rules, regulations and issuances of the ERC.
 - Bulk Users or End Users that are withdrawing electricity from the transmission system or from the distribution system which are permitted to trade in the WESM pursuant to prevailing rules, regulations and issuances promulgated by the ERC. It is provided, however, that Bulk/End Users connected through a distribution system may only transact in the WESM upon declaration of retail competition and open access by and shall transact in the WESM and subject to relevant rules, regulations and issuances of the ERC. All references to the Bulk or End Users in this Manual are understood to be subject to the foregoing condition. In case of any conflict between this Manual and the provisions of relevant rules, regulations and other issuances of the ERC, the latter shall prevail.
- c) A Customer shall register each of its connection points with the Market Operator. For each Contestable Customer, all connection points shall be registered under the same Contestable Customer.

2.5.3. Technical and Commercial Requirements

The persons or entities that met the membership criteria and are qualified to be registered as Trading Participants must also comply with the following requirements before they can be authorized to participate and transact in the WESM.

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2.5.3.2. Facilities. The Applicant must have the following facilities –

- a) Remote Terminal Unit (RTU) devices compliant with the requirements of the relevant network service provider, and are capable of being monitored by the facilities of the System Operator.
- b) Revenue metering facilities or installations compliant with the requirements set forth in Chapter 2 of the WESM Rules and relevant WESM manuals, and which metering installations are duly registered with a WESM-registered Metering Services Provider.
- c) Communication links with the Market Operator and the System Operator, which are compliant with specifications set forth by the Market Operator and the System Operator.

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3. WESM MANUAL ON DISPATCH PROTOCOL ISSUE 13.2, October 2020

6.0 Bids, Offers and Data Submission and Processing

6.1.2 Qualified *customers* or those registered by the *Market Operator* as *dispatchable load* may submit standing profiles of *demand bids* in respect of each one (1) hour interval for each of its

registered scheduled *load* facilities for each *trading day* of the week in accordance with the *timetable*. Submission of *demand bids* are provided for in *WESM Rules* Clause 3.5.6.

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6.1.7 *WESM Rules* Clause 3.5.11.5 requires *Trading Participants* to revise their *bids* or *offers* if they no longer represent a reasonable estimate of either the expected *availability* for the *dispatch interval* of the relevant *generating unit* or *scheduled load* or the *demand bids* or *offers* likely to apply in the *real-time dispatch* optimization for the *dispatch interval*.

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6.4 Categories of Self-scheduled Nominations, Bids, and Offers

6.4.1 The *self-scheduled nominations, bids, and offers* that can be submitted in the *WESM* are as follows:

- a. Real-time *market offers* for *scheduled generating units* of *Scheduled Generation Companies*;
- b. Operating *reserves offers* for certified *ancillary service providers*;
- c. *Demand bids* from customer *Trading Participants*; and
- d. *Self-scheduled nominations*
 - i. Schedule of *loading levels* (i.e. *energy quantities* only) for *non-scheduled generating units* of *non-scheduled Generation Companies*; and
 - ii. *Projected output* (i.e. *energy quantities* only) of *Generation Companies* with *must dispatch generating units* and *priority dispatch generating units*

6.9 Formats and Contents of Submission

6.9.5 *Trading Participants* shall provide the following information when submitting *demand bids*:

- a. Shall have up to 10 *bid* blocks per take-off point;
- b. Shall have a minimum block size of one (1) MW;
- c. Shall have monotonically decreasing prices;
- d. Shall start from a zero off-take;
- e. May have *bid* prices that are negative; and
- f. Shall include a validity period of *bids*.

8.4 Data Inputs/Information Requirements

8.4.1 Pursuant to *WESM Rules* Clause 3.7.4, the *market projections* shall take into consideration various data inputs. These inputs shall be made available or submitted to the *Market Operator* in accordance with the *WESM timetable* and the procedures set out in this Dispatch Protocol and relevant provisions of the *WESM Rules*.

8.4.2 The data inputs for the *market projections* are as follows:

- a. *Generation energy* and *reserve offers, self-scheduled nominations, and demand bids*
- b. *Demand/load forecast* determined in accordance with the *WESM Load Forecasting Methodology*
- c. *System snapshot*
- d. *Outage schedules*
- e. *Reserve Requirements*

- f. *Contingency* list
- g. Transmission limits
- h. *Over-riding constraints*
- i. System advisories

9.1 Real-Time Dispatch Scheduling

- 9.1.1 *WESM Rules* Clause 3.8 sets out the responsibilities of the *Market Operator* in the scheduling of *generation* and *load* in the *WESM*. Among other responsibilities, *WESM Rules* Clause 3.8.1 directs that prior to the commencement of each *dispatch interval*, the *Market Operator* shall use the *market dispatch optimization model* (MDOM) to determine the target *loading level* in MW for each *non-scheduled generating unit*, *must dispatch generating unit*, *priority dispatch generating unit*, *scheduled generating unit* or each *scheduled load* and for each *reserve facility* for the end of the *dispatch interval* using the latest data from the *System Operator* and the *Trading Participants*. The *Market Operator* shall submit to the *System Operator* the *dispatch schedule* containing the *target loading levels* to be achieved at the end of the *dispatch interval*.

4. WESM MANUAL ON MARKET NETWORK MODEL DEVELOPMENT AND MAINTENANCE – CRITERIA AND PROCEDURES ISSUE 4.2, November 2020

6.6 Customer MTN

- 6.6.1 A customer node is the point where energy is withdrawn by the *WESM* participant and the direction of the power flow is from the network operated by the Network Service Providers, including the *System Operator*, to the energy consuming apparatus or equipment (i.e. load) owned by or connected to the customer trading participant.
- 6.6.2 The information required from the customers during their submission of demand bids or reserve offers in the case of dispatchable loads are listed in Appendix A of the *WESM Rules*.