



PEM Audit Committee Report on the Market Readiness Assessment (MRA)

**For the implementation of enhanced WESM design and operations in
Luzon and Visayas, and WESM in Mindanao**

September 2019

This Report is prepared by the
Philippine Electricity Market Corporation –
Market Assessment Group for the
PEM Audit Committee



EXECUTIVE SUMMARY

This report by the PEM Audit Committee (PAC) provides updates on the Market Readiness Assessment (MRA) activity as of 24 September 2019 and discussion on the Final MRA Report for Mindanao. This augments the following PAC Reports:

1. 1st MRA Report in May 2019;
2. 2nd MRA Report in June 2019; and
3. 3rd MRA Report in August 2019.

The MRA activity is being conducted to ensure the effective transition to and implementation of the enhanced WESM design and operations in Luzon and Visayas, and WESM in Mindanao. It includes the conduct of a Parallel Operations Program (POP) by the Market Operator (MO), wherein the MO, System Operator (SO), PEMC, and Market Participants are able to try out for themselves the revised WESM processes, specifically the trading, dispatch, and settlement (i.e. bid to bill) processes with 5-minute dispatch intervals.

The Sapere Research Group Limited (Sapere), the third-party expert engaged to conduct the MRA activity, has submitted its Final Market Readiness Report for the implementation of the WESM in Mindanao. Sapere deemed that Mindanao will be ready once the Go-Live Conditions as identified in their MRA Report for Luzon and Visayas and Mindanao-specific Go-Live Conditions have been satisfied.

The PAC agrees with Sapere's recommendation for the said conditions to be resolved and supports the Market Readiness Steering Committee (MRSC) that is tasked to address said conditions and POP concerns.

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INTRODUCTION

This report by the PEM Audit Committee (PAC) provides updates on the Market Readiness Assessment (MRA) activity from 21 August 2019 to 24 September. This augments the following PAC Reports:

1. 1st MRA Report in May 2019;
2. 2nd MRA Report in June 2019; and
3. 3rd MRA Report in August 2019.

The PAC likewise discusses herein its views regarding the recommendations of the Sapere Research Group Limited (Sapere) in its Final MRA Report for Mindanao.

Background

As approved by the PEM Board, the Philippine Electricity Market Corporation (PEMC) engaged the Sapere to conduct the MRA under the oversight of the PAC. The MRA activity is being conducted to assess the readiness of the PEMC, Market Operator (MO), System Operator (SO), Metering Services Providers (MSPs) and WESM participants, identify issues for resolution as well as to provide necessary recommendations to ensure the effective transition to and implementation of the enhanced WESM design and operations in Luzon and Visayas, and WESM in Mindanao.

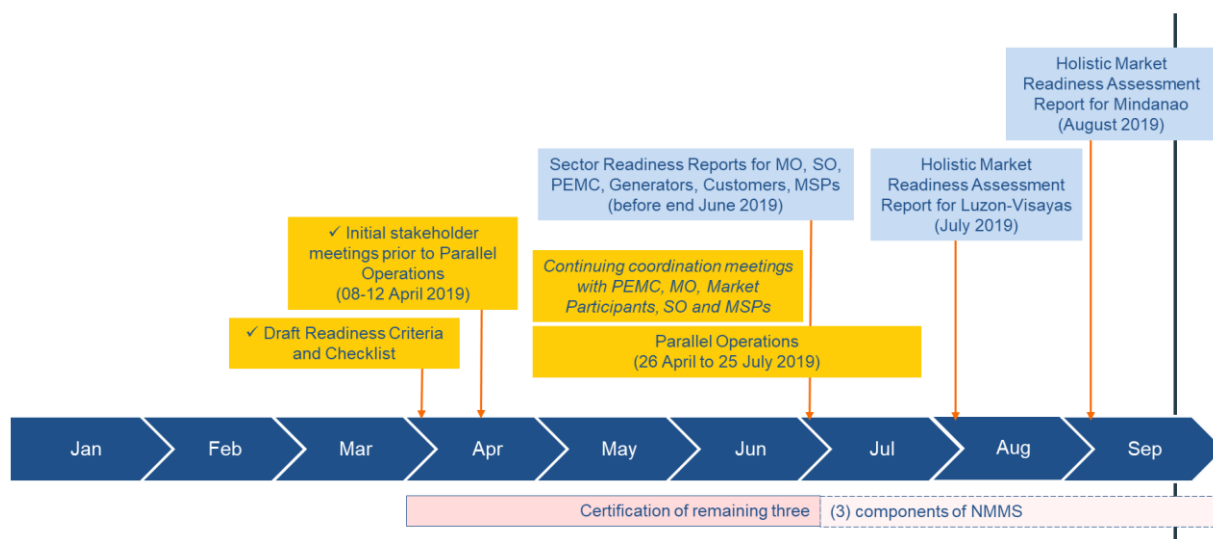
The MRA covered the conduct of a Parallel Operations Program (POP) by the Independent Electricity Market Operator of the Philippines (IEMOP), under the supervision of Sapere. The POP enabled the MO, SO, PEMC, and Market Participants to try out for themselves the revised WESM operations, specifically the trading, dispatch, and settlement (i.e. bid to bill) systems and processes with 5-minute dispatch intervals.

The POP tested the operational functionality and interfaces of the new Market Management System (NMMS) and Central Registration and Settlement System (CRSS). That is, it assessed the reliability of the systems from the point of taking up participant bids, creation of dispatch instructions, the publication of prices, and preparation of settlements.

With the results of the POP and consultations with the concerned parties, the MRA also identified issues arising from the corresponding changes in their systems, processes, and paradigms.

MRA TIMELINE AND ACTIVITIES

Key deliverables of the MRA activity are the submission of reports by Sapere and the conduct of consultation meetings as shown in the timeline below.



For the period 21 August 2019 to 20 September 2019, MRA activities were focused on the review and approval of the MRA Reports by Sapere.

After the PAC's review and acceptance on 19 August 2019, Sapere submitted the revised Final MRA Report for Luzon and Visayas on 30 August 2019, with minor revisions. A copy was likewise provided to the IEMOP by email, while the PAC submitted the Final Report to the PEM Board and DOE on 04 September 2019. Coincidentally, comments from the National Grid Corporation of the Philippines (NGCP) on the draft version of the Report was received on the same day.

NGCP's comments included their updates on the results of their security assessment for the period 01 to 15 July 2019 and their ongoing coordination with the IEMOP on the MO-SO interfaces through the eDNA and webservices.

On the other hand, the draft MRA Report for Mindanao was submitted by Sapere on 20 August 2019 and was provided to the National Grid Corporation of the Philippines (NGCP) and MO. The PAC presented the MRA Report for Mindanao to the PEM Board on 28 August 2019. After incorporating comments from PEMC, Sapere submitted the revised Final MRA Report for Mindanao on 09 September 2019, which was accepted by the PAC during its regular meeting on 20 September 2019.

HOLISTIC ASSESSMENT FOR MINDANAO

Sapere deemed that Mindanao will be ready for the commercial operations of the WESM when the Go-Live Conditions identified in their MRA Report for Luzon and Visayas are addressed. Sapere likewise noted issues specific to Mindanao that remained to be completed in order to ensure the effectiveness of the market readiness, as follows:

1. Delays with market registration.
2. Low number of market participants participating in the POP, although a very high capacity was represented in the POP, with a number of Mindanao participants also being active in Luzon and Visayas and are thus familiar with trading in the WESM.
3. Internet connectivity may impact on dispatch and settlement and thus be a limiting factor on the level of efficiencies that can be realised through the new market-based arrangements. However, the advantages of moving to WESM in Mindanao is far more compelling than the risk that the System Operator may have to resort to current dispatch practices if issues arise.
4. Meter Service Agreements and IEMOP/System Operator interfaces and data transfer protocols are not yet fully resolved.

Sapere further identified non-technical issues, such as collection issues, free-riding off Ancillary Services and uneconomical use of inefficient generation units, which may impede the smooth launch of WESM in Mindanao. The PAC notes that the implementation of WESM in Mindanao will provide the mechanisms to address, if not fully resolve, these issues.

In view of the foregoing, the PAC agrees with Sapere's recommendations and supports the MRSC that is tasked to address said conditions and POP concerns.

MRSC WORK STREAM ACTION PLAN UPDATES

As of the MRSC Meeting 6 held on 17 September 2019 and updated timeline provided by IEMOP on 23 and 24 September 2019, updates on the Action Plans by Work Streams addressing the Go-Live Conditions are provided below. It is noted that the MRSC added another Work Stream to monitor the readiness of PEMC.

A. MO Readiness

Status	Action Plans	Timeframe	Updates as of 24 September
Ongoing	IEMOP to work with NMMS vendor on patch to resolve performance and/or reliability issues	September 2019 - <i>Revised from August 2019 as requested by IEMOP to complete enhancements and fixes</i>	<ul style="list-style-type: none"> Major variances already escalated to Siemens, including priority list (i.e., which to resolve first). Enhancements and fixes are covered by change orders or maintenance agreement with Siemens. (NMMS enhancements may be audited starting on the 2nd week of October 2019)
Ongoing	<p>IEMOP to remediate failed settlement server hardware and re-run month-end settlement process.</p> <p>IEMOP to remediate CRSS performance and storage issues, and complete settlement runs.</p>	<p>September 2019 - <i>Revised from August 2019 as requested by IEMOP to fix CRSS bugs</i></p> <p>December 2019</p>	<ul style="list-style-type: none"> July and August settlement run to be performed by 26 September 2019 CRSS Database Storage Upgrade activities as follows: <ul style="list-style-type: none"> Procurement Process: 23 September to 31 October 2019 Delivery of Product (Solid State Drives): 05 November to 05 December 2019 Implementation (Installation, Configuration, Testing, Documentation): 06 to 20 December 2019

Status	Action Plans	Timeframe	Updates as of 24 September
Ongoing	<p>IEMOP to resolve forecast accuracy issues, by coordinating with SO for the immediate resolution of the e-DNA data transmission issues.</p> <p>Forecast accuracy issue has been assessed as attributable to reliability of SO ICCP data transmission using SO's e-DNA system.</p>	<p>NGCP target to use e-DNA (for LVM) by September 2019 – <i>Revised from EO July 2019 due to issues</i></p>	<ul style="list-style-type: none"> On 16 September, NGCP sent (raw and calculated) data points via ICCP to IEMOP to improve forecast accuracy <ul style="list-style-type: none"> IEMOP will finish mapping these data by 19 September Forecast accuracy is expected to improve Ongoing testing of e-DNA <ul style="list-style-type: none"> Data retrieval for Luzon and Visayas is established, while data retrieval for Mindanao will be discussed on 18 September.
Continuing activity	<p>Work with participants to ensure connectivity, access and functionality issues are resolved.</p>	<p>Issues are being addressed as they are reported to IEMOP</p>	<ul style="list-style-type: none"> PIPPA provided its member-generators with copies of the MRSC Letter enjoining generators to submit standing and working offers Participation updates: <ul style="list-style-type: none"> 101 out of 201 generators have standing offers Submission of working offers have improved 17% average submission of BCQ declaration IEMOP to request Waiver Form or Sign-off Document by WCOs attesting that DUs/Gens/MSPs have tried and tested the NMMS and CRSS
Ongoing	<p>Confirm that the NMMS system changes have not invalidated IES audit results.</p>	<p>September 2019 – <i>From July 2019 for NMMS Audit due to load forecasting review data issues</i></p> <p>November 2019</p>	<ul style="list-style-type: none"> Pre-certification audit of the NMMS is still ongoing for the Load Forecasting module until August 2019 Software audit of other MO NMMS enhancements/fixes, CRSS modules/enhancements, tools, and

Status	Action Plans	Timeframe	Updates as of 24 September
		(Software Audit)	software will be implemented in October 2019 to November 2019

B. SO Readiness

Status	Action Plans	Timeframe	Updates as of 24 September
Ongoing	SO to complete security assessment	September 2019 – <i>Revised from August 2019</i>	<ul style="list-style-type: none"> Awaiting MO to complete NMMS enhancement that will address issues on data transfer
Ongoing	NGCP to use e-DNA (for LVM)		<ul style="list-style-type: none"> SO is working out with the eDNA supplier regarding the break status not being transmitted to IEMOP via ICCP

C. MSP/Customer Readiness

Status	Action Plans	Timeframe	Updates as of 24 September
Continuing follow-up with DOE	Impress on DOE importance of an early decision about 5- and 15-minute data submission at “Go live”. Follow up status on approval of proposed amendments to Retail Metering Manual allowing MSPs to submit 15-minute meter data to CRSS	August 2019	<ul style="list-style-type: none"> PAC reiterated list of rules change for approval in its submission of the MRA Report for Luzon and Visayas on 04 September 2019 Other proposed rules changes have been submitted to the DOE, which are identified by PEMC to be necessary for Go-Live (see Annex A: List of List of Proposed Changes to Rules and Manuals for DOE Approval for Go-Live as of 20 August 2019)
Done	IEMOP to enhance CRSS to provide 15-minute meter read inputs for MSPs that have yet to convert to 5-minute reads	July 2019	<ul style="list-style-type: none"> Enhancement deployed on 31 July 2019.
Done	IEMOP to document suggested training modules and criteria for accomplishment and communicate to MSPs	August 2019	<ul style="list-style-type: none"> IEMOP conducted trainings for MSPs on 22 and 23 August.
Ongoing	Develop a follow up survey to clarify	September 2019	<ul style="list-style-type: none"> IEMOP is currently conducting survey. Results to be presented in the next MRSC meeting.

Status	Action Plans	Timeframe	Updates as of 24 September
	any aspects of this issue if required		<ul style="list-style-type: none"> Per IEMOP, Mindanao participants are not accessing the CRSS and there is a need to conduct hands-on training on a regular basis. On MERALCO, they have agreed with IEMOP that they will participate in the POP and submit 5-minute and 15-minute MQ data.

D. Mindanao Readiness

Status	Action Plans	Timeframe	Updates as of 24 September
Done	PEMC and DOE to agree on messaging for Mindanao	August 2019	<ul style="list-style-type: none"> DOE approved proposed Go-Live date for Mindanao (26 January 2020) on 05 July 2019
Ongoing	PEMC to work with SO to establish whether some of the DUs with embedded generation could be allowed to operate autonomously within its franchise area (along the lines of a DSO type arrangement)	November 2019 – <i>Moved from August 2019 due to TC timeline</i>	<ul style="list-style-type: none"> PEMC/TC is conducting a study on the technical issues of embedded generation in Mindanao (3Q 2019 - 2Q 2020)

E. Price Determination Methodology

Status	Action Plans	Timeframe	Updates as of 24 September
Done	Ensure all price outcome reports contain transparency and explanation on which inputs are being used	July 2019	<ul style="list-style-type: none"> IEMOP submitted pricing analysis report to the ERC in July 2019
Ongoing	Audit remaining modules (especially forecast tool) and clear through ERC hearing process	September 2019 – <i>From July 2019 for NMMS Audit due to load forecasting review data issues</i>	<ul style="list-style-type: none"> CMON report and software certificates finalized on 07 August 2019 Load Forecasting audit is still ongoing <ul style="list-style-type: none"> Draft RTD report for submission by IES on 26 September 2019 Ongoing testing of HAP/DAP/WAP

F. Reserves

Status	Action Plans	Timeframe	Updates as of 24 September
Done	Steering committee to communicate the steering committee's recommendation (energy only market on Go-Live)	July 2019	<ul style="list-style-type: none"> Done. PEMC presented to the DOE on 05 July the MRSC's recommendations, which the DOE approved.
Ongoing	Make the day 1 scenario clear to the market (energy only market; A/S are centrally scheduled by the IEMOP, in accordance with the central scheduling approved by the DOE for the current market)	August 2019 (for updating)	<ul style="list-style-type: none"> IEMOP and NGCP to draft an A/S Protocol

G. Generator Readiness

Status	Action Plans	Timeframe	Update as of 17 September
Ongoing	Ensure participation of generators	Continuing activity	<ul style="list-style-type: none"> PIPPA to conduct a generator's meeting/Kapihan to discuss issues

H. PEMC Readiness

Status	Action Plans	Timeframe	Updates as of 24 September
Ongoing	Enhance the Market Assessment System (MAS)	November 2019	<ul style="list-style-type: none"> Data Collection and Validation Module <ul style="list-style-type: none"> Development: 100% complete Testing: Delayed testing and validation with actual data due to unavailability of complete data from IEMOP Post Processing and Reporting Module <ul style="list-style-type: none"> Development: On-going Testing: On-going but will eventually need actual data for validation Real-time Monitoring Module <ul style="list-style-type: none"> Development: On-going

Status	Action Plans	Timeframe	Updates as of 24 September
			<ul style="list-style-type: none"> ○ Testing: On-going but will eventually need actual data for validation ● Way Forward: Constant coordination with IEMOP and NGCP for the <ul style="list-style-type: none"> ○ Completion of the Data Exchange Facility (DEF) and availability of data in real-time ○ Completion of DEF Protocol and SLA
Ongoing	Implement Compliance Post Evaluation Monitoring System (CPEMS)	September 2019	<ul style="list-style-type: none"> ● UI (Participant Interface) Module <ul style="list-style-type: none"> ○ Development: 100% complete; successfully used for six (6) Participant Trainings ○ Testing: On-going UAT/Bug fixes ● Assessment Module <ul style="list-style-type: none"> ○ Development: 100% complete ○ Testing: On-going UAT/Bug fixes ● FAS (Forecast Accuracy) Module <ul style="list-style-type: none"> ○ Development: 98% complete (delayed coding of FAS report and web service data exchange) ○ Testing: On-going UAT ● Way Forward: Constant and close coordination with HDI (Developer)

Annex A: List of Proposed Changes to Rules and Manuals for DOE Approval for Go-Live as of 05 September 2019

Proposal	Description	Approved by PEM Board	Status	Documents for Amendments
Proposed Amendments to WESM Rules and Proposed ECO Manual	Amendments to WESM Rules and proposed ECO Manual for consistency with amendments to WESM Penalty Manual	30-Aug-18	<ul style="list-style-type: none"> • 03 Sep 2018 – endorsed to DOE • Jan & Feb 2019 – DOE pubcon • 03 Jun 2019 – DOE-PEMC meeting regarding comments received 	WESM Rules
				New ECO Manual
Proposed Amendments to WESM Rules and WESM Manual on Market Surveillance, Compliance and Enforcement	Further amendments to WESM Rules and various Manuals regarding market surveillance	30-Aug-18	<ul style="list-style-type: none"> • 03 Sep 2018 – endorsed to DOE • Jan & Feb 2019 – DOE pubcon • 03 Jun 2019 – DOE-PEMC meeting regarding comments received 	WESM Rules
				MSC Manual
Proposed Amendments to the WESM Penalty Manual		10-Sep-18	<ul style="list-style-type: none"> • 03 Sep 2018 – endorsed to DOE • Jan & Feb 2019 – DOE pubcon • 03 Jun 2019 – DOE-PEMC meeting regarding comments received 	WESM Penalty Manual
Proposed Amendments to the WESM and Retail Rules and Various Manuals to Reduce Barriers to Entry and Participation in Retail Competition		23-Apr-19	<ul style="list-style-type: none"> • 14 May 2019 – endorsed to DOE 	WESM Rules
				Retail Rules
				Retail Registration Manual
				Retail Metering Manual
				Retail Market Transactions Manual
				Retail Information Disclosure and Confidentiality Manual
				WESM Billing and Settlement Manual

Proposal	Description	Approved by PEM Board	Status	Documents for Amendments
				WESM Registration Manual
Proposed Amendments to the WESM Manual on Registration, Suspension, and De-Registration Criteria and Procedures	<ul style="list-style-type: none"> • include additional modelling requirements for registering new facilities • harmonize timelines • clarify basis of MO for changes in registered capacities 	29-May-19	• 06 Jun 2019 – endorsed to DOE	WESM Registration Manual
Proposed Amendments to the WESM Metering Manual Issue 12.0	<ul style="list-style-type: none"> • to align with DOE circulars, PGC, PDC and ERC issuance on metering 	31-Jul-19	• 16 Aug 2019 – endorsed to DOE	WESM Manual on Metering Standards and Procedures
Proposed Amendments to the WESM CVC and Pricing ¹ Re-run Manual to Reflect Hierarchy of Self-scheduled Generation	<ul style="list-style-type: none"> • to include additional CVCs to reflect the dispatch and curtailment hierarchy for non-sched, priority and must-dispatch gens 	16-Aug-19	• 05 Sep 2019 – endorsed to DOE	WESM Constraints Violation Coefficients and Pricing Re-run Manual