



GoRADIATE

PEMC Market Report 2019



**“Let us unite as one.
Let us GO RADIATE!”**



Noel V. Aboboto

Chairman, Philippine Electricity Market
Board of Directors

CHAIRMAN'S MESSAGE

It is a diligent task to maintain the efficiency and dynamism in the Wholesale Electricity Spot Market (WESM) while fostering fair competition among the market participants at the same time. The Philippine Electricity Market Corporation (PEMC) stood unperturbed amidst these challenges and accomplished a successful 2019. It has always been our resolute commitment to provide quality services to our stakeholders and industry partners, and that's the least that PEMC will deliver in the coming years.

This 2020, our aim is to shine even brighter – to RADIATE as we work towards the realization of PEMC's goals.

- G** – Go Live of the New MMS in Luzon and Visayas
- O** – Open WESM Mindanao
- R** – Renewable Energy Market Operations
- A** – Anti-Competitive Behavior (ACB) Framework Formulation
- D** – Derivatives Market for Electricity
- I** – Integrated Management System (IMS) Certification
- A** – Audit of Market Operations and Metering Review
- T** – Training and IEC Initiatives
- E** – Enforcement and Compliance Regime

We encourage our industry partners to take part more actively in working towards achieving these goals. Together, let us face the new challenges ahead of us and make use of our learnings and experiences from 2019 to keep us ablaze towards becoming a Premier Electricity Market and Champion of Governance.

Let us unite as one. Let us GO RADIATE!

PRESIDENT'S REPORT

The Philippine Electricity Market Corporation (PEMC), the governing body of the Wholesale Electricity Spot Market (WESM), ensures the effective and proactive governance of the power bourse to safeguard the interest and welfare of the Filipino consumers.

With the support of the PEM Board, WESM Governance Committees (WGC), WESM Members, and the policy-making and regulatory bodies, we are pleased to report the following accomplishments realized pursuant to our mandate –

Ensuring market readiness for the Enhanced WESM Design

PEMC conducted consultation meetings with market participants to uncover challenges, especially for the WESM Mindanao implementation. Together with the Independent Electricity Market Operator of the Philippines (IEMOP), PEMC presented recommendations addressing commercial and operational structures specific to Mindanao. Moreover, PEMC facilitated the audit of the New Market Management System (NMMS) and the Central Registration and Settlement

System (CRSS). The audit achieved near completion with the issuance of software certificates for key modules by the external auditor.

Establishment of the Renewable Energy Market (RE Market)

PEMC, in coordination with the Department of Energy (DOE) and United Nations Development Programme (UNDP) facilitated and approved the user acceptance test reports for the completion of the Philippine Renewable Energy Market System (PREMS). Moreover, the main site and disaster recovery site for the

PREMS were installed and configured successfully. PEMC likewise conducted pilot workshops for the RE Market participants and started the preparations for participant registration.

Promoting a Culture of Compliance

PEMC implemented a streamlined process where initial non-compliances undergo pre-assessment prior to endorsement for investigation. In 2019, PEMC investigated a total of 133 cases, composed of 57,680 intervals, two percent (2%) of which was found in breach. PEMC likewise initiated a rules change proposal

for the WESM Compliance Officers (WCO) Accreditation and developed the Guidelines for the Offer for Settlement, which were duly approved by the Market Surveillance Committee (MSC) on 20 May 2019.

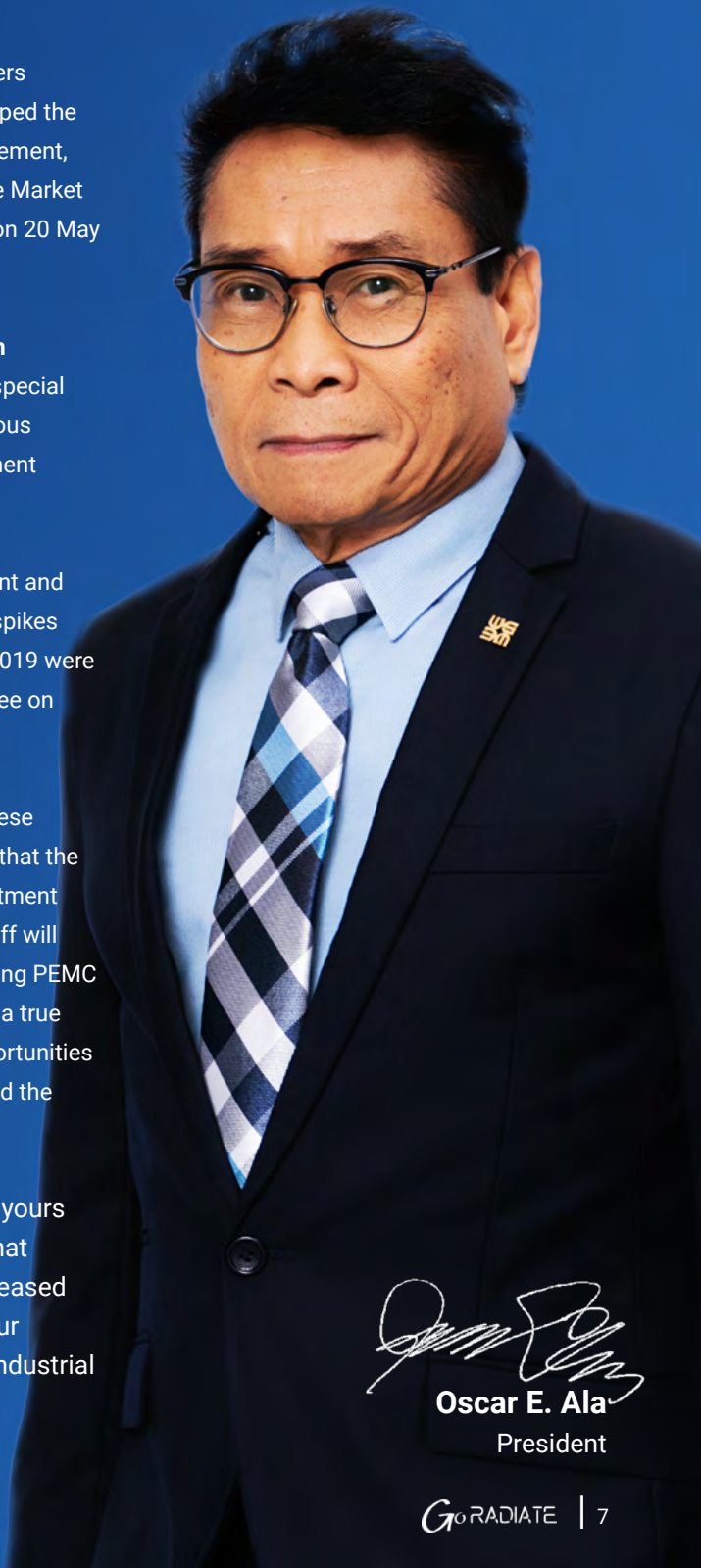
Promoting Efficient Competition


PEMC presented more than 10 special reports on the resolution of various market monitoring and assessment concerns to the PEM Board.

Furthermore, PEMC's assessment and recommendations on the price spikes that occurred from 10-15 April 2019 were provided to the Senate Committee on Energy.

The past year was marked by these notable achievements. I believe that the burning enthusiasm and commitment of PEMC's Management and staff will prove to be instrumental in making PEMC a premier electricity market and a true champion of a multitude of opportunities for growth in the spot market and the entire power industry.

With our concerted efforts – yours and ours – we truly believe that together, we will achieve increased accessibility to electricity, spur market growth, and sustain industrial and economic prosperity.




Oscar E. Ala
President

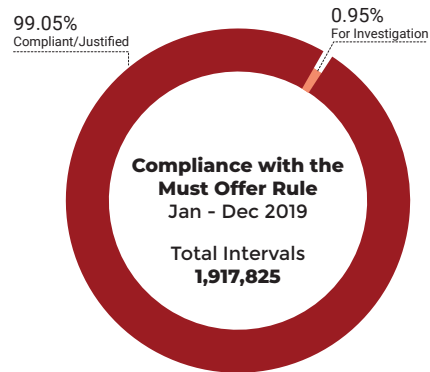


ENFORCEMENT AND COMPLIANCE

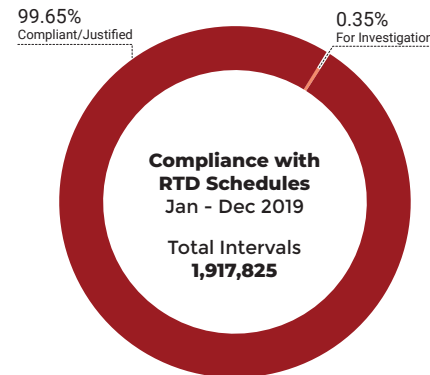
Jan – Dec 2019

- Improved WESM Generator Participant compliance performance

COMPLIANCE WITH THE MUST OFFER RULE		
Findings	No. of Intervals	Percentage
Compliant/Justified	1,899,593	99.05%
For Investigation	18,232	0.95%
Grand Total	1,917,825	100.00%



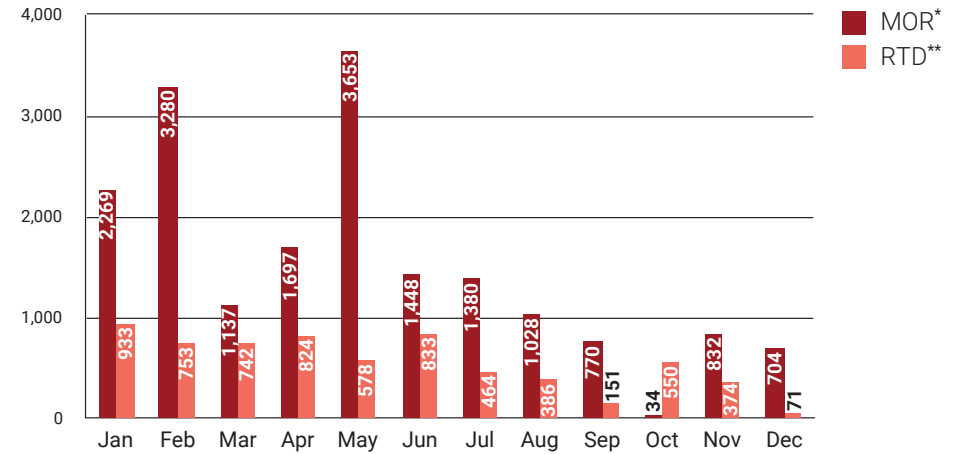
COMPLIANCE WITH THE RTD RULE		
Findings	No. of Intervals	Percentage
Compliant/Justified	1,911,166	99.65%
For Investigation	6,659	0.35%
Grand Total	1,917,825	100.00%



- Reduced number of intervals endorsed for investigation
- Improved investigation process – paperless, immediate, and proactive approach in addressing issues and concerns

Intervals Endorsed For Investigation

Jan – Dec 2019 Billing Period



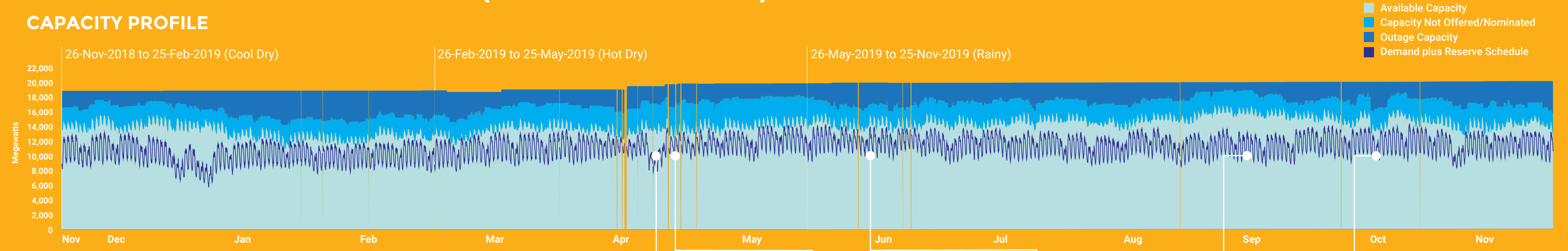
*MOR - Must Offer Rule
**RTD - Real-time Dispatch

- Conferences with WESM Participants and plant visits to facilities in Luzon and Visayas for better appreciation and understanding of generators' operations
- Improved reporting of WESM Participant compliance and status of investigations
- Drafting of the accreditation program for the WESM Compliance Officers (WCOs)
- Preparation of the WESM Participants for the enhanced compliance system under the enhanced WESM design through lectures and hands-on trainings



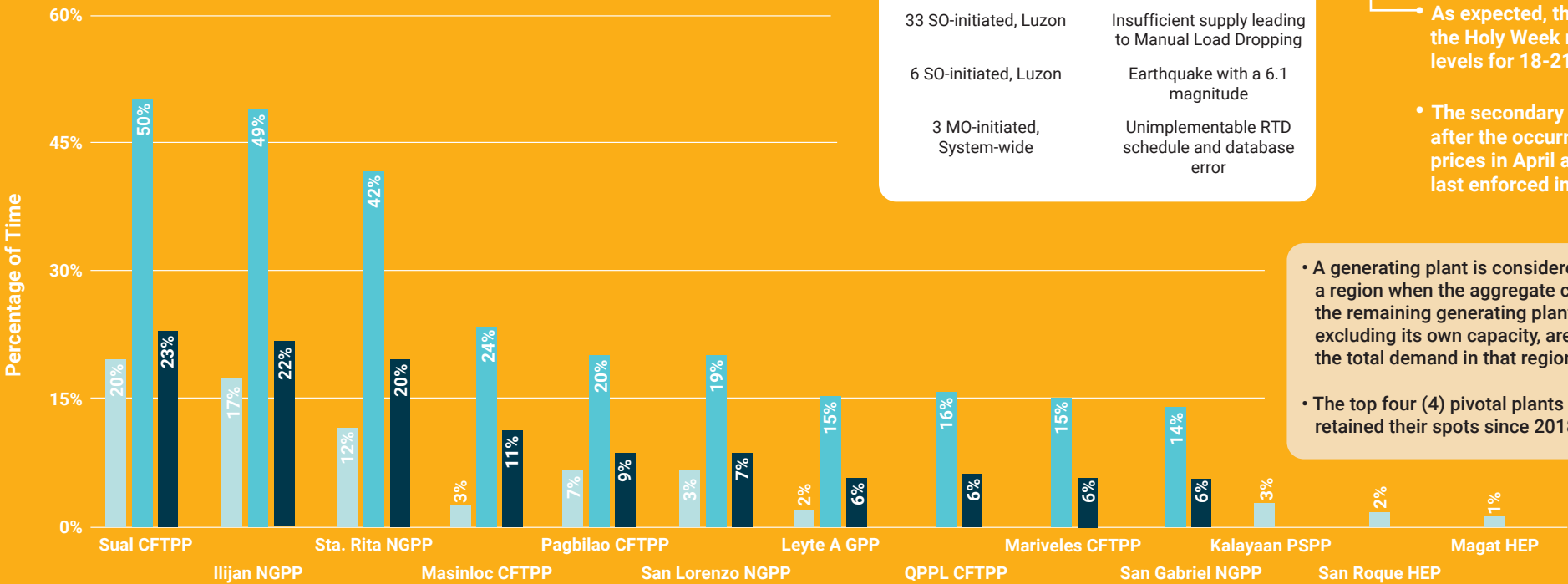
MARKET ASSESSMENT HIGHLIGHTS (NOV 2018 - NOV 2019)

CAPACITY PROFILE



The highest levels of outages were recorded in January and February, a few months before the May 2019 national and local elections.

TOP PIVOTAL PLANTS



BREAKDOWN OF THE SEASON'S 42 MARKET INTERVENTION EVENTS	
Number of Market Intervention Events	Reason for Market Intervention
33 SO-initiated, Luzon	Insufficient supply leading to Manual Load Dropping
6 SO-initiated, Luzon	Earthquake with a 6.1 magnitude
3 MO-initiated, System-wide	Unimplementable RTD schedule and database error

An earthquake with a 6.1 magnitude caused plant outages in Luzon on 22 April 2019.

As expected, the annual observance of the Holy Week resulted in low demand levels for 18-21 April 2019.

The secondary price cap was imposed after the occurrence of sustained high prices in April and May 2019. This was last enforced in September 2014.

- A generating plant is considered pivotal in a region when the aggregate capacities of the remaining generating plants, after excluding its own capacity, are less than the total demand in that region.
- The top four (4) pivotal plants have retained their spots since 2018.

The highest recorded monthly average system demand, including reserve schedule, was at 12,030 MW in June.

The highest recorded monthly average system Load-Weighted Average Price (LWAP) for 2019 was at PHP 7,769.00/MWh in June.

The rainy season had more secondary price cap impositions compared to the hot and dry months. This was especially persistent in June.

The highest recorded monthly average effective supply was at 13,894 MW in September.

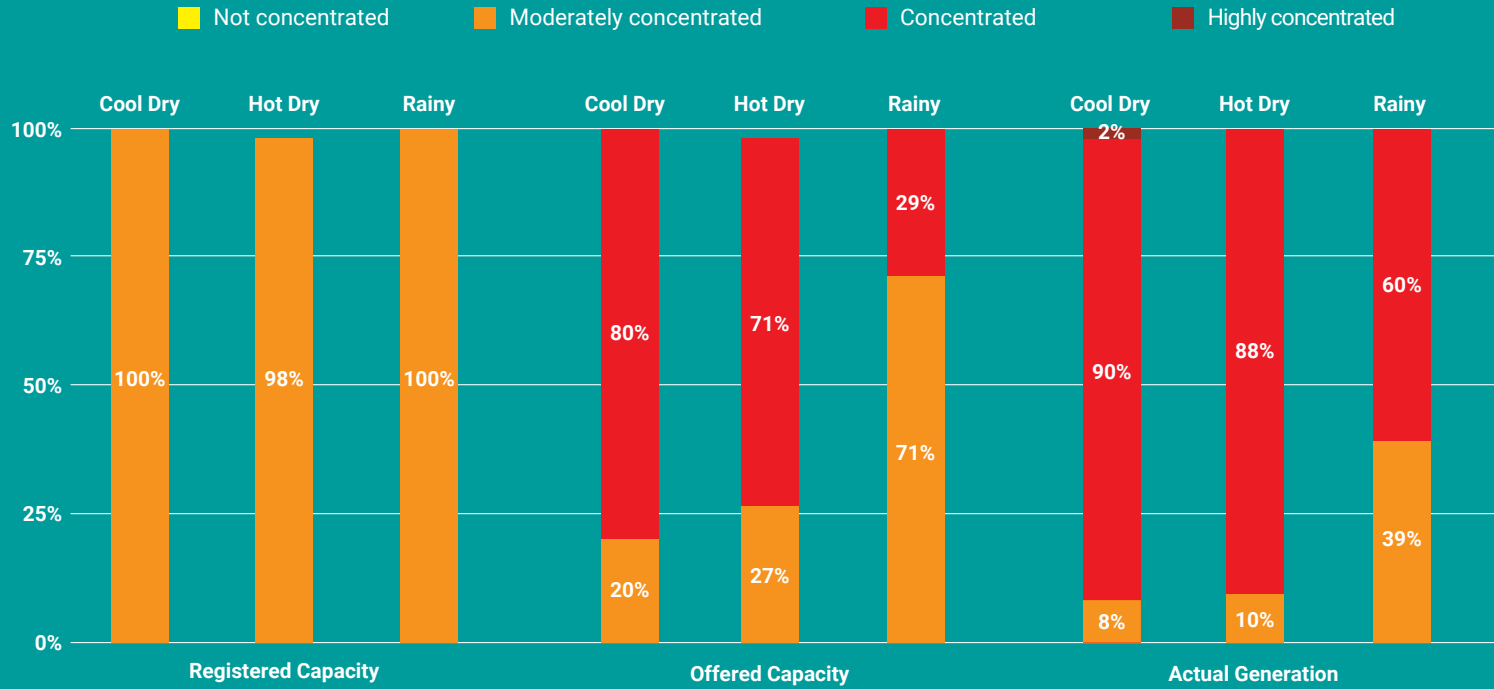
Power plants that rely on fuel from the Malampaya's natural gas production had to shut down following the SPEX Malampaya Maintenance Program in October.

BREAKDOWN OF THE SEASON'S 16 MARKET INTERVENTION EVENTS	
Number of Market Intervention Events	Reason for Market Intervention
10 SO-initiated in Luzon	Insufficient supply leading to manual load dropping
4 SO-initiated in Visayas	
2 MO-initiated System-wide	MMS stoppage

MARKET ASSESSMENT HIGHLIGHTS (NOV 2018 - NOV 2019)

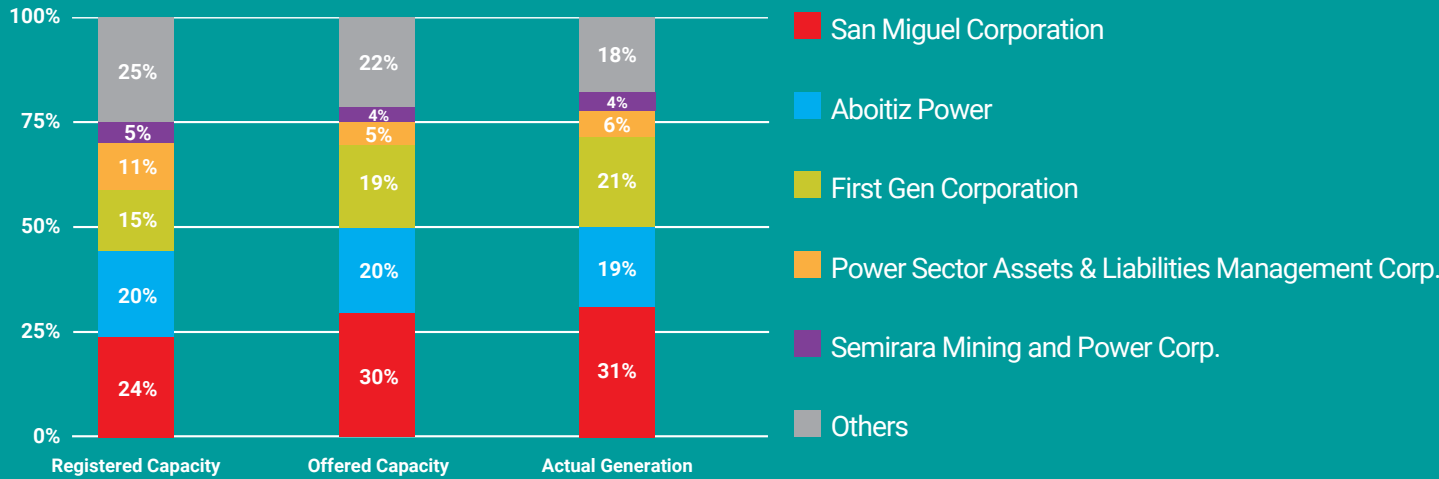
HERFINDAHL-HIRSCHMAN INDEX (HHI)

The HHI is an indicator of market competition.

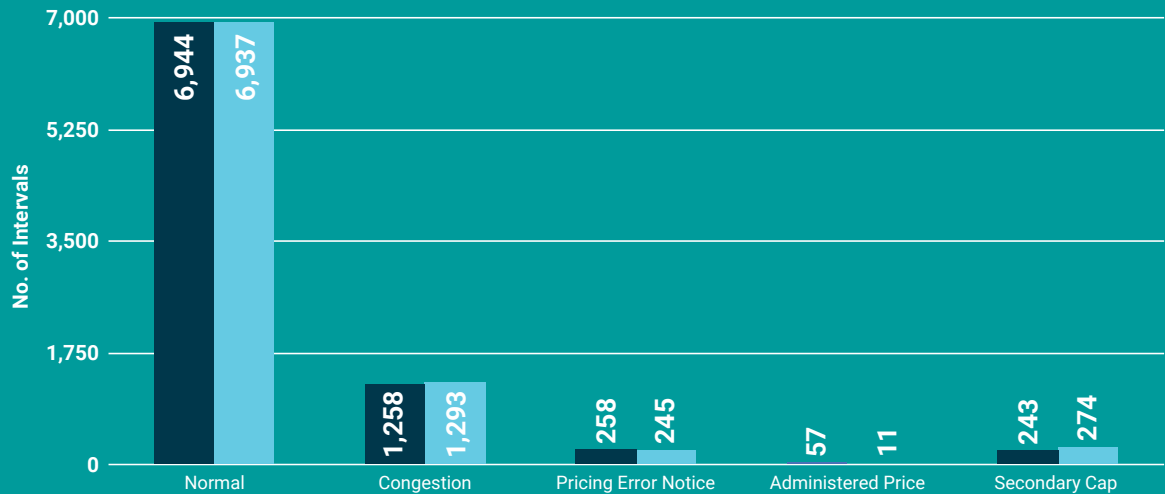


Note: No computation of HHI for intervals under Market Intervention/Market Suspension

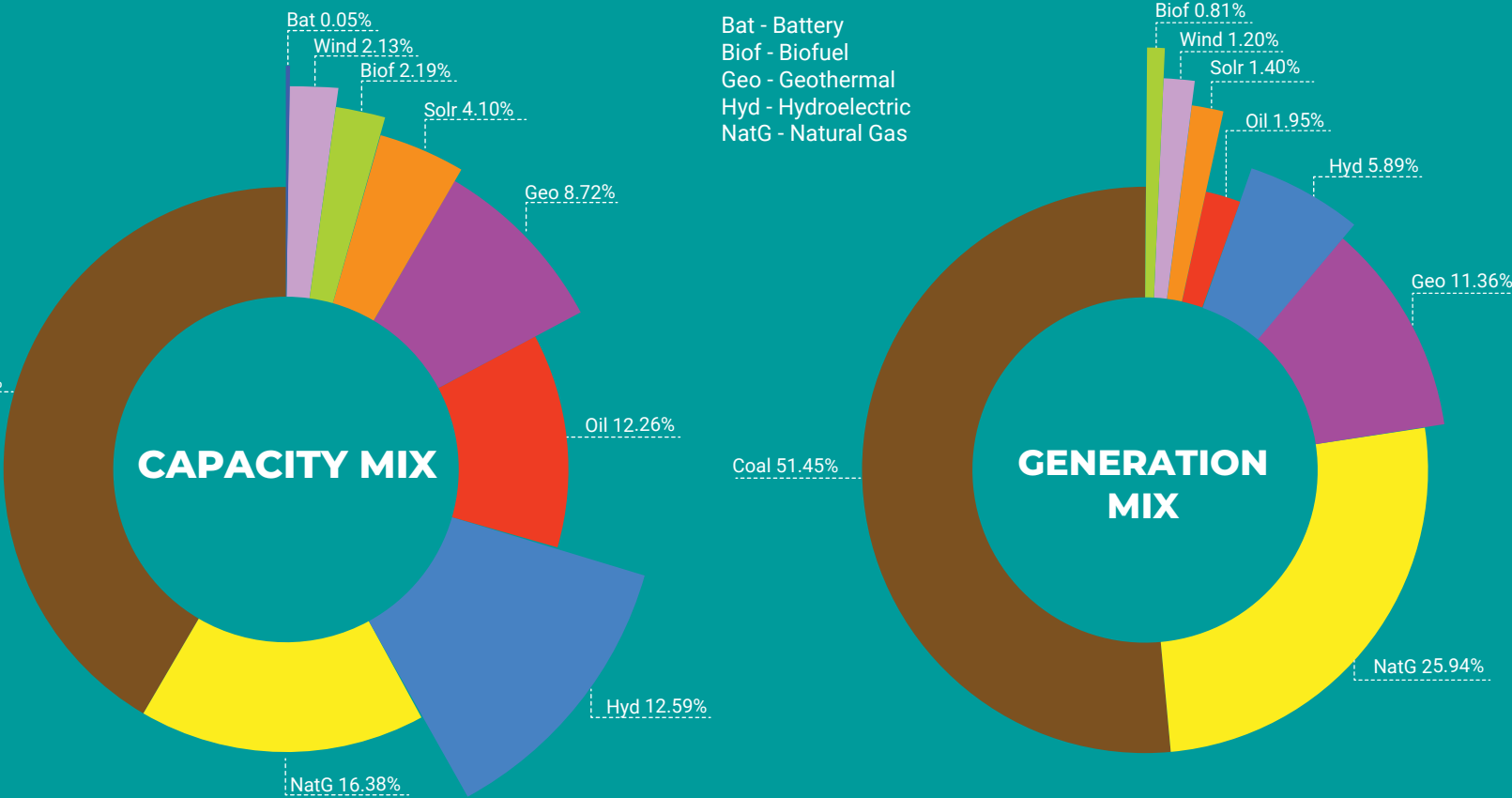
MARKET SHARE



PRICING CONDITIONS



- Improvement in the congestion situation as the number of intervals with Price Substitution Methodology went down by around 21% as compared to the 2018 billing year, noting that the Samboan-Amlan line in the Cebu-Negros islands was the most frequently congested line.
- Intervals imposed with administered pricing were more evident in 2019 with the Hot Dry Season having the most Market Intervention events.





WESM GOVERNANCE COMMITTEE ACCOMPLISHMENTS



DISPUTE RESOLUTION ADMINISTRATOR (DRA)

The DRA, Atty. Jesusito G. Morillos, facilitates the resolution of disputes between or among the parties in accordance with the WESM dispute resolution process.

In 2019, the DRA successfully administered the conduct of two (2) arbitration proceedings for the following –

Cases	Subject of Dispute
WESM-Arb-18-01	Claims for Real-time Dispatch Underpayment
WESM-Arb-18-02	Claims for Settlement as Must-Run Unit

The Arbitral Tribunal, composed of Atty. Teodoro Kalaw, Atty. Eduardo Ceniza, and Atty. Dranyl Jared Amoroso, issued the final awards for the said cases on 19 August 2019. Copies of the dispute resolution reports are available in the PEMC website.



MARKET SURVEILLANCE COMMITTEE (MSC)

Primarily monitors and assesses the trading activities in the WESM to ensure market efficiency and fair competition

A. Market Monitoring and Assessment

- Submitted to the PEM Board, the Department of Energy (DOE),

and the Energy Regulatory Commission (ERC) its assessment on the Wholesale Electricity Spot Market (WESM) and the retail

market, as follows: (a) Twelve (12) Monthly Monitoring Reports (MMR), covering November 2018 to October 2019, (b) Annual Market Assessment Report (AMAR) for billing year 2018; (c) Four (4) Quarterly Retail Market Monitoring Reports, covering the fourth quarter of 2018 to the third quarter of 2019; and (d) Annual Retail Market Monitoring Report for 2018

- Completed the Special Market Assessment Report on the Price Spike Events in April 2019, and conducted a review of the high market prices that were observed in November 2019
- Reviewed 13 Monthly Reports on Over-riding Constraints from November 2018 to November 2019, and deliberated on issues related to the prolonged testing and commissioning (T&C) of plants in the WESM
- Reviewed Market Intervention (MI) events that were declared in 2019, and prepared the corresponding Review Reports for the PEM Board

- Review of Market Monitoring Indices and subsequent enhancements on the spot price and offer pattern indices
- Deliberated on the WESM Industry Code of Ethics
- Participated in several rules change processes within PEMC and rule-making processes initiated by the DOE and the ERC, through the submission of comments

B. Enforcement and Compliance

- Reviewed Compliance Monitoring and Assessment Reports (CMAR) from November 2018 to October 2019, and issued 209 Requests for Investigation (RFIs) on non-compliances to the WESM Rules
- Completed the review of 41 ECO Investigation Reports and deliberated upon Motions for Reconsideration
- Conducted a historical review of the status of non-compliance cases





PEM AUDIT COMMITTEE (PAC)

Responsible for the effective and independent audits of the operation of the market and of the Market Operator (MO), review of metering installations and arrangements, and special audits as directed and/or required by the PEM Board

- Provided oversight on the Market Readiness Assessment (MRA) activities conducted by a third-party expert, Sapere Research Group Ltd (Sapere), from April to August 2019. The readiness of the Market Operator (MO), National Grid Corporation of the Philippines – System Operator (NGCP-SO), Metering Service Providers (MSPs), WESM Participants, and PEMC were assessed to ensure the effective transition to the enhanced WESM design and operations in Luzon and Visayas and implementation of WESM in Mindanao
- Endorsed the recommendations of Sapere for the creation of the Market Readiness Steering Committee (MRSC) composed of champions from PEMC, MO, NGCP-SO, and the Philippine Independent Power Producers Association (PIPPA) in June 2019 to ensure that the go-live conditions identified during the assessment are addressed
- Provided periodic updates on the MRA and MRSC activities to the PEM Board, DOE, and ERC
- Supervised the software certification of five (5) remaining New Market Management System (NMMS) critical components conducted by an external auditor, Intelligent Energy Systems Ltd Pty (IES)
- Supervised the software certification audit of the NMMS and Central Registration and Settlement System (CRSS) enhancements and fixes, and other MO systems and tools for the enhanced WESM design and operations. The audit by IES started in October 2019 and was still ongoing as of December 2019
- Reviewed the quarterly and annual Market Operator Performance Monitoring Reports covering the period 26 September 2018 to 25 September 2019 and presented the same to the PEM Board. The reports provide the results of the monitoring and assessment of the

MO's performance based on the DOE-approved Market Operator Performance Standards (MOPS).

Started developing a new set of performance measures aimed at monitoring and assessing the MO performance under the enhanced WESM design and operations

- Secured on 30 October 2019 the PEM Board's approval on the proposed Joint Conduct of the 7th Market Operations Audit and 4th Review of Metering Installations and Arrangements covering the period 26 June 2016 to 25 December 2019, and the procurement of external audit services for the same



RULES CHANGE COMMITTEE (RCC)

Facilitates the formulation of new Market Rules and Manuals and any amendments thereto, the enhancement of the market design, and the refinement of market processes and operations appropriate for the current environment

For 2019, the RCC duly processed and endorsed to the PEM Board 19 proposals to amend the WESM Rules, Retail Rules, and various Market Manuals in the following areas –

- **Market Governance** – Market audits, monitoring of MSPs' performance, forecast accuracy of must-dispatch generating units, and WESM Compliance Officers' Accreditation Program
- **WESM Operations** – Registration process and timeline, initial prudential requirements,
- **Retail Market** – Responsibilities of participants, switching of Suppliers, and requirements for retail metering installations
- contingency plan during prolonged market system failure, requirements and procedures related to metering, constraint violation coefficients, and timing of market runs

The proposals were endorsed to the DOE for final approval and promulgation. Most of these changes are intended to be in effect upon the commencement of the enhanced WESM design.



TECHNICAL COMMITTEE (TC)

Tasked to monitor and review technical matters under the WESM Rules, the Philippine Grid Code, and the Philippine Distribution Code in relation to the operation of the spot market

In 2019, the TC accomplished the following –

- Developed a work plan to assess and provide recommendations on the increased integration of Variable Renewable Energy (VRE) resources and other new technologies into the WESM
- Conducted consultation activities with the MO, NGCP-SO, ERC, and the Market Participants for the development of the MO-SO-DU-EG Coordination Protocol
- Provided assistance to the PAC in the procurement of the external auditor for the joint conduct of the 7th Market Operations Audit and 4th Review of Metering Installations and Arrangements
- Provided the RCC with comments and inputs on the Proposed Amendments to the WESM Rules and Various WESM Manuals
- Presented views and recommendations on technical concerns raised by WESM Participants on their participation in the market, such as Mactan Electric Company and Toledo Power Corporation

RENEWABLE ENERGY NOW!



The passage in 2008 of RA 9513 or the Renewable Energy Act aims to further accelerate the development of the country's renewable energy resources, which include hydropower (which we have been using since the 1950s), geothermal, wind, solar, and biomass.

BATTERY

Battery Energy Storage Systems are beginning to be utilized especially in remote areas to complement renewable energy technologies.



SOLAR

Solar cells contain silicon layers. When sunlight strikes these layers, electrons flow from the silicon and are harnessed to generate electricity. Potentially, the amount of power from the sun the earth receives is more than what the entire world consumes in a year.

WIND

The wind spins blades that turn turbines to generate electricity. The efficiency of wind plants is highly dependent on the weather, and modern wind turbines produce electricity 70-85% of the time. Advancements in wind turbine technology include longer blades, taller towers, stronger materials, and cloud computing with drone maintenance systems.



HYDRO

The kinetic energy of running water is used to turn turbines, which in turn generate electricity. Dams are built to artificially create a steady flow of water, but run-of-river hydroelectric systems use less intrusive means to redirect water to generate electricity.

GEOTHERMAL

Beneath the crust of the earth is a layer of hot and molten rock called magma. Wells are dug to harness this heat to boil water to generate steam to push turbines. Locations around the Pacific Rim such as the Philippines, where seismic and volcanic activity are high, are good areas to set up geothermal plants.



BIOMASS

Organic waste such as rice hull and coconut shells, which the Philippines is abundant in, is used as fuel to generate electricity.



