INTENSIFIED ENVIRONMENTAL PROTECTION

Among the directives of the DENR Chief is to improve the quality of our environment, particularly on air and water; and how to address the solid waste problems. Thus, the DENR has been implementing environmental protection programs and projects.

CLEAN AIR PROGRAM

The program covers the full implementation of Clean Air Act. The objective of this program is to achieve and maintain air quality that meets the National Air Quality Guidelines for Criteria Pollutants throughout the Philippines, while minimizing the possible associated negative impacts on the country's economy. Thus, in order to effectively monitor and regulate all sources of air emissions, the Clean Air Program is divided into three sub-programs: (1) Motor Vehicle Emission Management Program, (2) Industrial Emission Management Program, and (3) roadside ambient and general ambient air monitoring.

Motor Vehicle Emission Management Program (Bantay Tambutso)

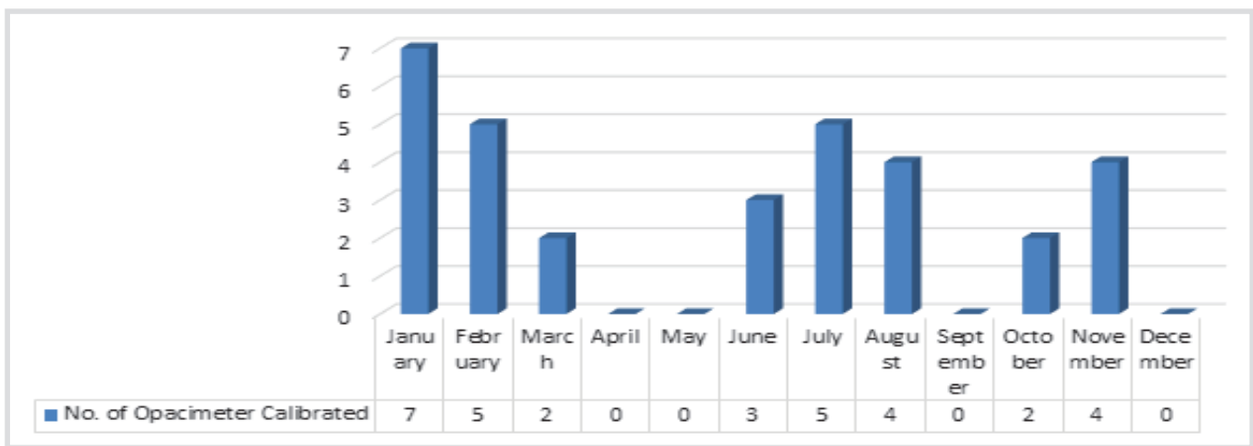


Figure 4.1 No. of Opacimeters calibrated by month

The main concern of the Bureau with regard to motor vehicle emission management is to regulate the quality of vehicles being introduced into the Philippine market by virtue of DAO 2015-04. "Implementation of Vehicle Emission Limits for EURO 4/IV and in-use Vehicle Emission Standards. To ensure that the equipment used would generate accurate results in the apprehension of vehicles by Local Government Units (LGUs), 32 units were calibrated as shown in Figure 4.1

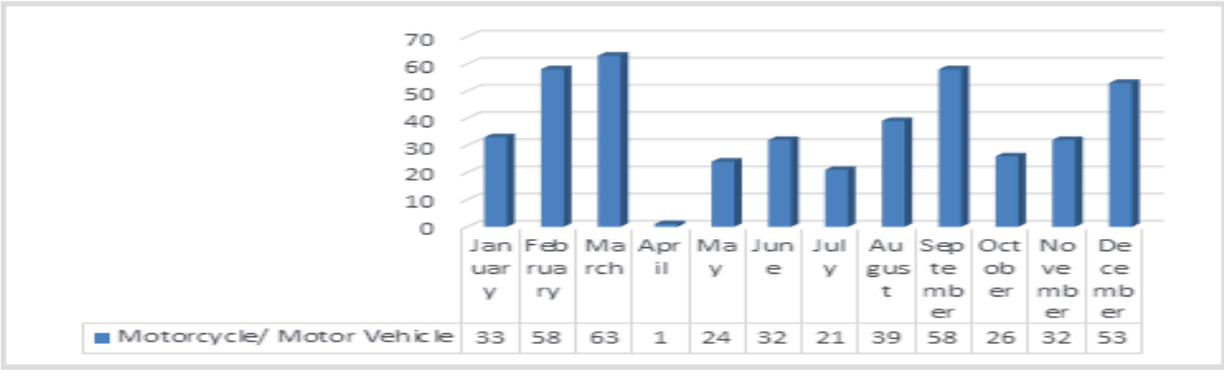


***Figure 4.2** Certificate of Conformity issued for motorcycle/motor vehicle*

Figure 4.2 shows the number of COCs issued, by month. As mandated by Section 22 of the RA 8749, any imported new or locally-assembled motor vehicles shall not be registered unless it complies with the emission standards. For CY 2020, 440 certificates were issued.

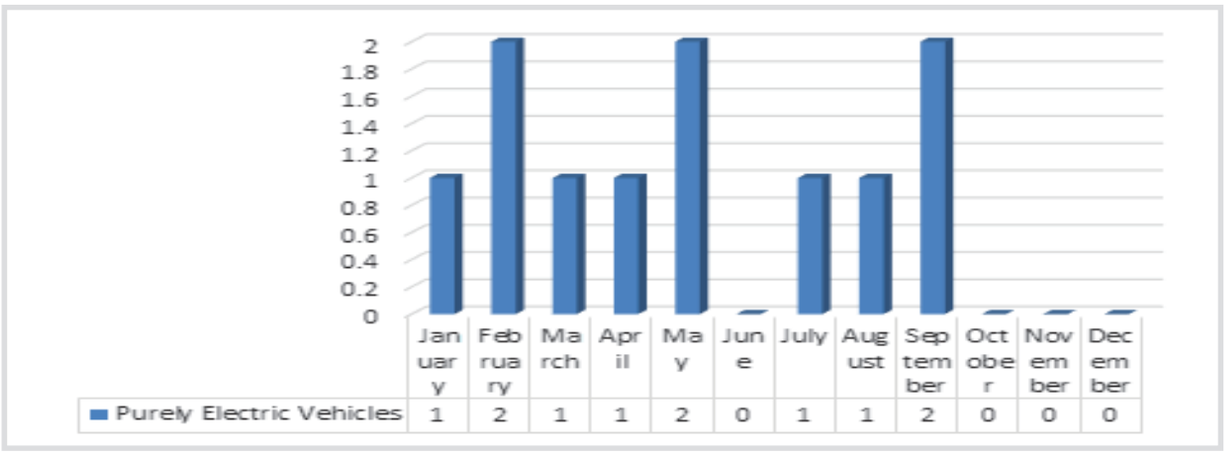


***Figure 4.3** Certificate of Non-Coverage issued*

Figure 4.3. shows the number of CONCs issued for Purely Electric Vehicles, by month, in compliance with BIR Regulation No. 24, Series of 2018. For CY 2020, 11 CONCs were issued.

In 2020, Anti-Smoke belching operations for this year in Metro Manila were suspended due to the strict implementation of health protocols issued by the Inter-Agency Task Force on Emerging Infectious Diseases (IATF-EID) to prevent the spread of COVID-19 virus.

Industrial Emission Management Program (Bantay Tsimneya)

In compliance with Sections 8 and 38 of Republic Act No. 8749 (Philippine Clean Air Act of 1999) and Rule XLVII Section 2 (c) of DAO 2000-81 (Implementing Rules and Regulations of the Clean Air Act), the DENR through the EMB has established the Sampling Assessment Team (SAT) thru Special Order No. 2014-207, later amended thru SO. No. 2018-296, to monitor the emissions from Air Pollution Source Installations (APSI) of industries nationwide. In view of the magnitude of APSIs installed nationwide, the Accreditation of Third-Party Source Emission Testing Firms (TPSETFs) thru DAO 2013-26 was also established to aid in the above-mentioned mandate of the EMB. One of the major responsibilities of the SAT is to monitor, review, and accredit TPSETFs. Relative hereto, a total of 22 firms with 43 teams have been accredited as per accreditation procedures as stipulated in DAO 2013-26.

Roadside Ambient and General Ambient Air Monitoring
Particulate Matter 10 (PM_{10})

Air quality nationwide in terms of PM10 has significantly improved by 64% from CY 2011 baseline (From 76 µg/Ncm in CY 2011 to 27 in CY 2020).

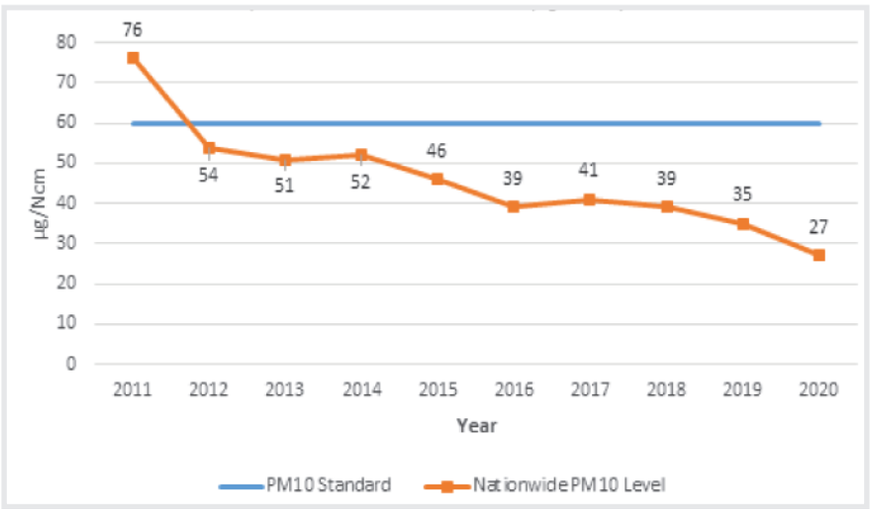


Figure 4.4 *Nationwide Air Quality in PM_{10} (CY 2011-2020)*

Particulate Matter 2.5 ($PM_{2.5}$)

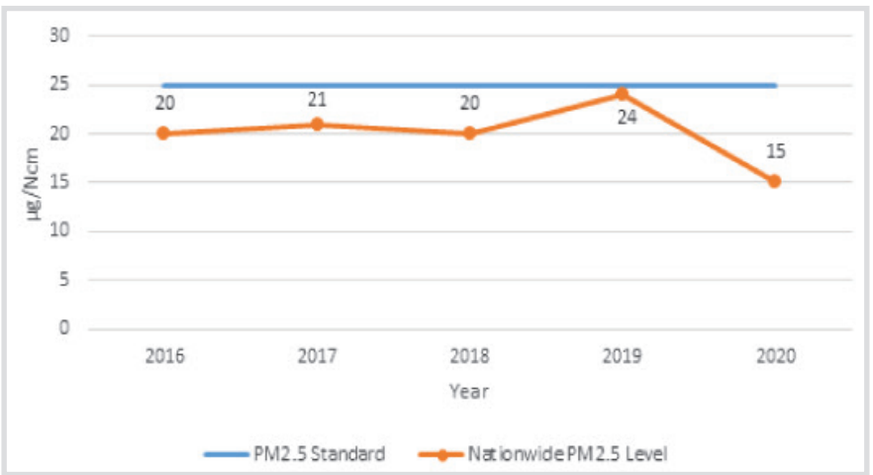


Figure 4.5 *Nationwide Air Quality in $PM_{2.5}$ (CY 2016-2020)*

Status of Metro Manila Air Quality

With the declaration of community quarantine and strict implementation of lockdowns in Metro Manila, the 75% data requirement for air quality monitoring stations was not achieved. Hence, data captured in CY 2020 may not be representative for CY 2020.

Figure 4.6 *During the implementation of Enhanced Community Quarantine in Metro Manila*

Air Quality Assessment during Taal Volcano Eruption

On 12 January 2020 at 7:30 PM, the Department of Science and Technology – Philippine Institute of Volcanology and Seismology (DOST – PHIVOLCS) raised the Alert Level 4 (Hazardous Eruption Imminent) as Taal Volcano in Batangas located about 60 kilometers south of Manila spewed ash 10 – 15 km high following a phreatic or steam-driven eruption in several points inside the crater which had begun at 1:00 PM. As of 12:00 noon, Taal Volcano remained under Alert Level 4 as it spews lava fountains.

The DOST – PHIVOLCS issued through a bulletin at 8:00 AM 13 January 2020 that spewing of lava called a magmatic eruption was recorded from 2:49 AM to 4:28 AM. This eruption is characterized by weak lava fountaining accompanied by thunder and lightning.

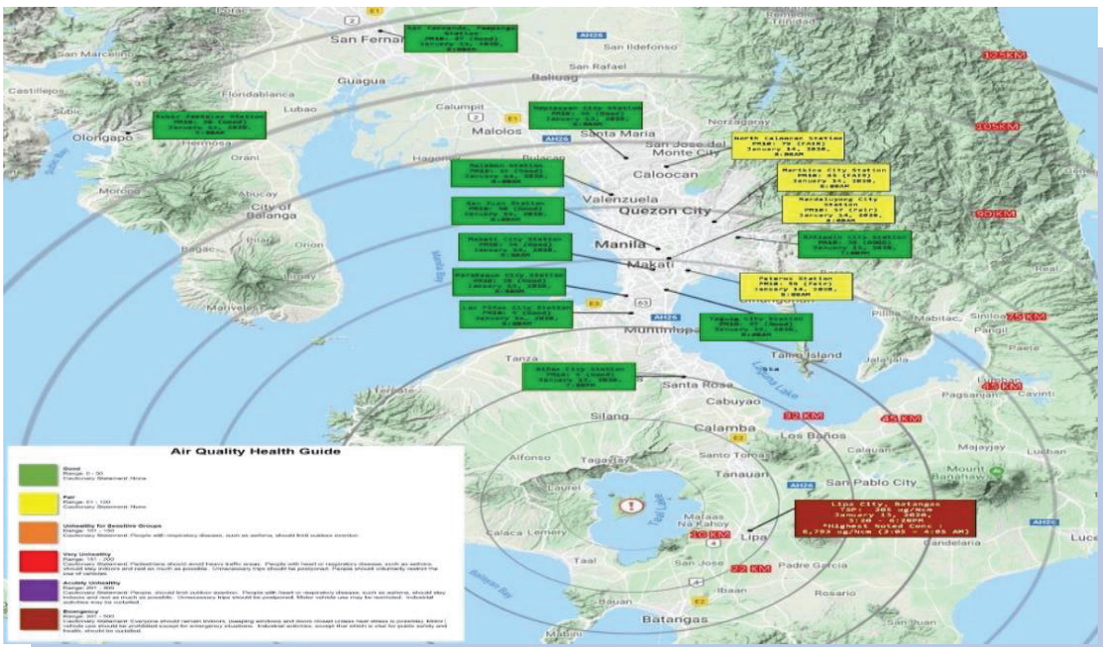


Figure 4.7 Distance of Air Quality Monitoring Stations from Taal Volcano

In addition, Total Suspended Particulates (TSP) manual monitoring station located at Purok 1, Barangay Balintawak, Lipa City has measured hourly TSP concentrations up to 6,793 µg/Ncm (3:05 AM – 4:05 AM), 6,381 µg/Ncm (6:10 AM – 7:10 AM), 2,231 µg/Ncm (7:15 AM– 8:15 AM), 1,522 µg/Ncm (8:20 AM– 9:20 AM), and 524 µg/Ncm (2:50 PM – 3:50 PM), way above the 300 µg/Ncm ambient air quality guideline value.

The EMB has coordinated with the Department of Health (DOH), World Health Organization (WHO), and Interagency Committee on Environment and Health (IACEH). Pursuant to RA 8749, ambient air quality data is reported as AQI for the general public to better understand the quality of air.

Figure 4.8 contains the dos and dont's as well as the effects to the public health whenever there is a volcano eruption.

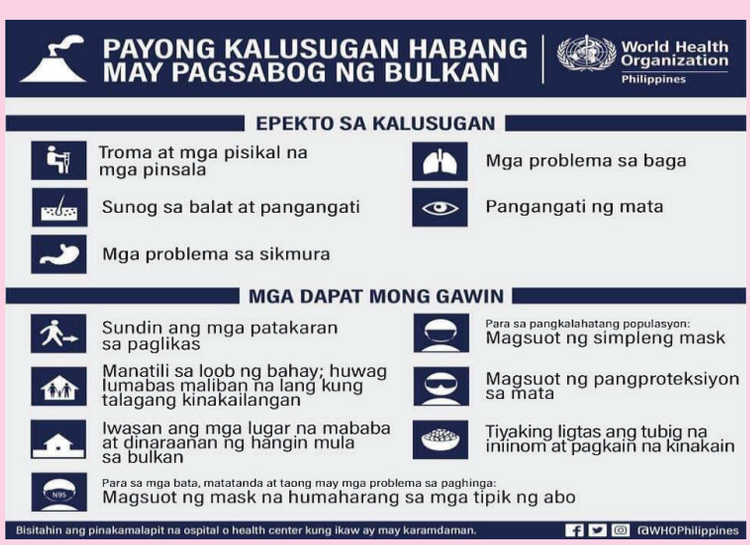


Figure 4.8 Public Advisory during volcano eruption

Air Quality Assessment during the Luzon-Wide Enhanced Community Quarantine (ECQ)

The Philippine Government issued the Luzon-wide Enhanced Community Quarantine (ECQ) on March 16, 2020. As a result, the ambient air quality levels in cities of Metro Manila were significantly reduced by as much as 59% based on the weekday comparative analysis of PM10 concentrations. Weekday comparative analysis are conducted by comparing weekdays in different weeks (e.g. Monday in 1st week vs Monday 2nd week vs 3rd week etc.) and as much as 86% for daily comparative analysis. This was attributed to the decrease in fossil-fueled vehicles which is approximately 81% of air pollution sources in Metro Manila.

The ECQ has halted the above smoke belchers by preventing approximately 96% of the Average Daily Traffic (ADT) to travel in Metro Manila. The partial lockdown on Metro Manila and extending the metropolis' class suspensions up to April 12, 2020 has reduced the ADT only to government vehicles, essential services, skeletal force, and those who use their vehicles to purchase essential commodities. For the above reason, air quality was significantly improved.

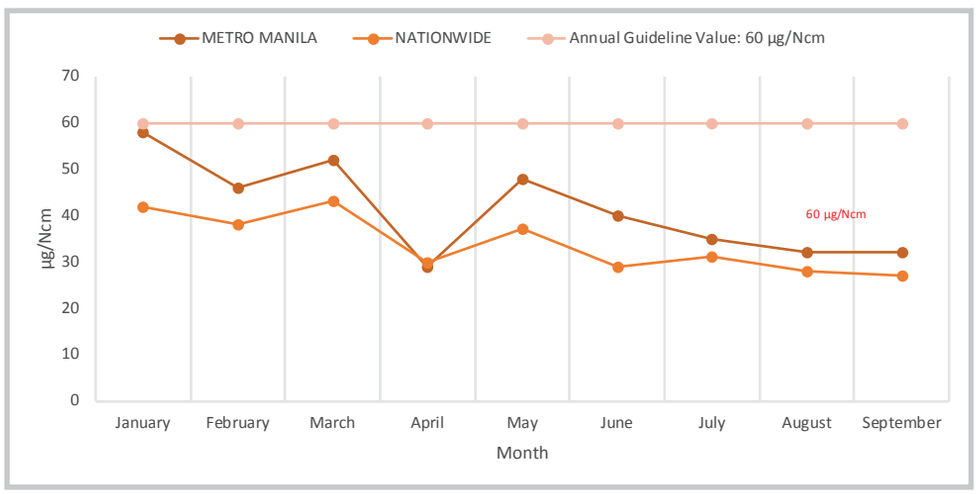


Figure 4.9 PM 10 monitoring during the implementation of ECQ

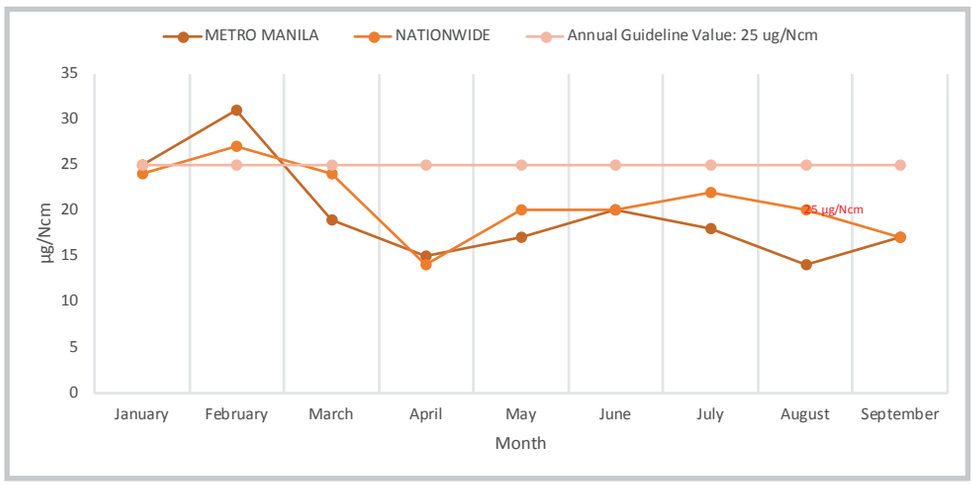


Figure 4.10 PM 2.5 monitoring during the implementation of ECQ

The halt in the operation of the industrial facilities resulted in significant reduction in PM, CO2, NOx and SOx emission. A significant 99% reduction was recorded in area sources such as aircraft emission, automotive fires, structural fires, dry cleaning, adhesive industry, open burning, residential and non-residential construction, residential cooking, among others.

The implementation of ECQ has not only resulted in cleaning the air, but also allowed the Metro Manila skyline to be visible to neighboring provinces and allowed Sierra Madre Mountain Range to be visible to residents of Metro Manila.

Ambient Air Quality Monitoring on New Year's Eve 2021

As part of the traditional New Year's Eve celebration, the Environmental Management Bureau – Central Office in close coordination with the EMB Regional Offices conducted ambient air quality monitoring through its Ambient Air Quality Monitoring Stations (Manual and Automatic) from December 31, 2020 to January 1, 2021.

Metro Manila Air Quality on New Year's Eve
Particulate Matter 10 (PM_{10})

During the CY 2021 New Year's Eve (NYE) celebration, a total of eight (8) stations in the National Capital Region (NCR) measured PM_{10} ambient air quality data while six (6) stations in NCR were comparable to the CY 2020 NYE.

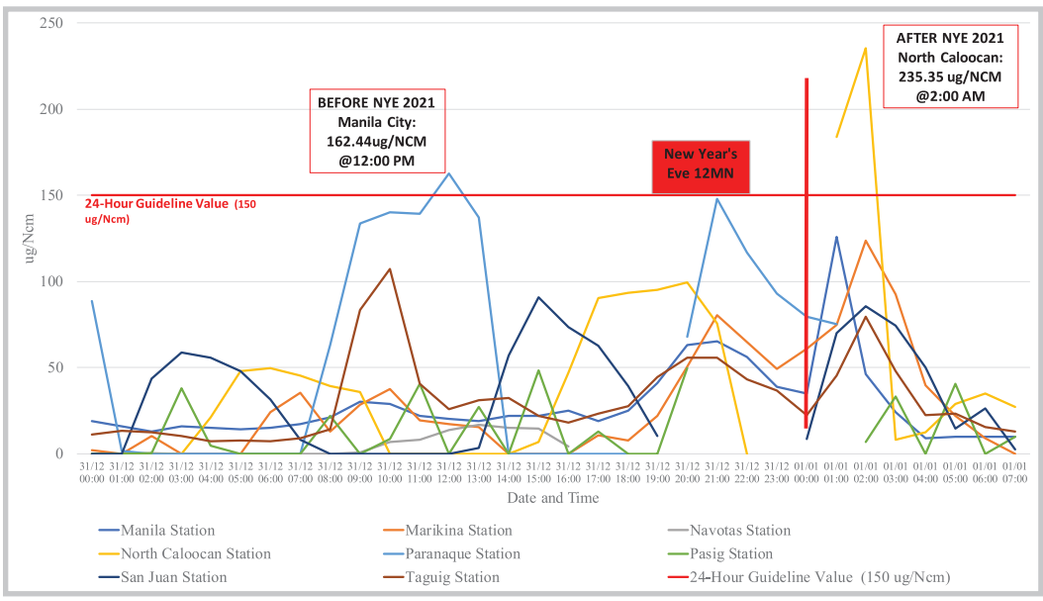


Figure 4.11 Status of Metro Manila during New Year's Eve in PM_{10}

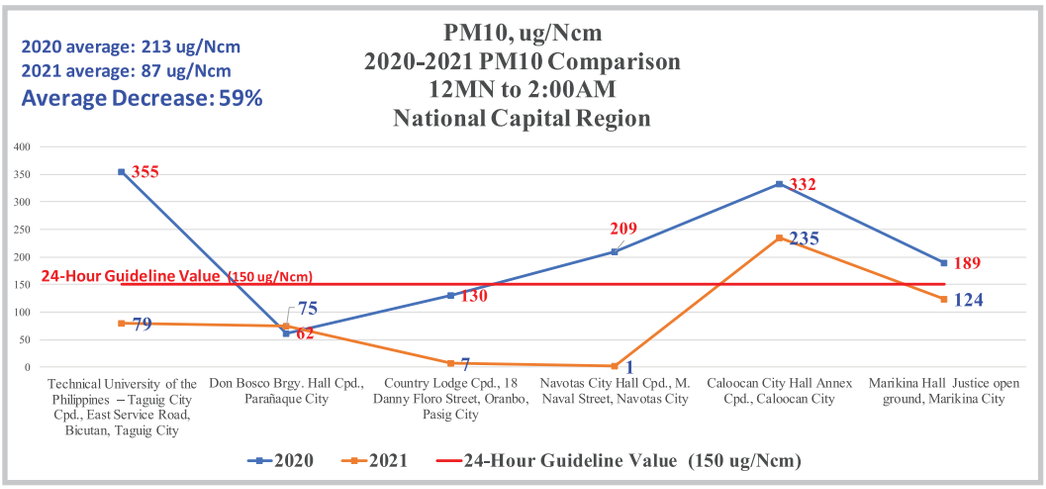


Figure 4.12 Status of National Capital Region during New Year's Eve in PM 2.5

Based on the result, the NYE 2021 had significantly lower concentrations of PM_{10} compared to the NYE 2020 at an average of 59% decrease, which is attributed to the strict measures being implemented by the Metro Manila Mayors pursuant to MMDA Resolution No. 20-17 "Prohibiting Individual and Household Use of Firecrackers and Other Pyrotechnic Devices During General Community Quarantine".

Particulate Matter 2.5 (PM2.5)

During the CY 2021 New Year's Eve celebration, two stations in NCR measured PM2.5 ambient air quality data.

NYE 2021 had significantly lower concentrations of PM2.5 compared to the NYE 2020 particularly for the station in Muntinlupa Bilibid open ground in Muntinlupa City which posted a maximum concentration of 12 ug/Ncm between 12 midnight to 2 AM of January 1, 2021. The reading accounts for a 43% drop from 22 ug/Ncm obtained for the same period last year.

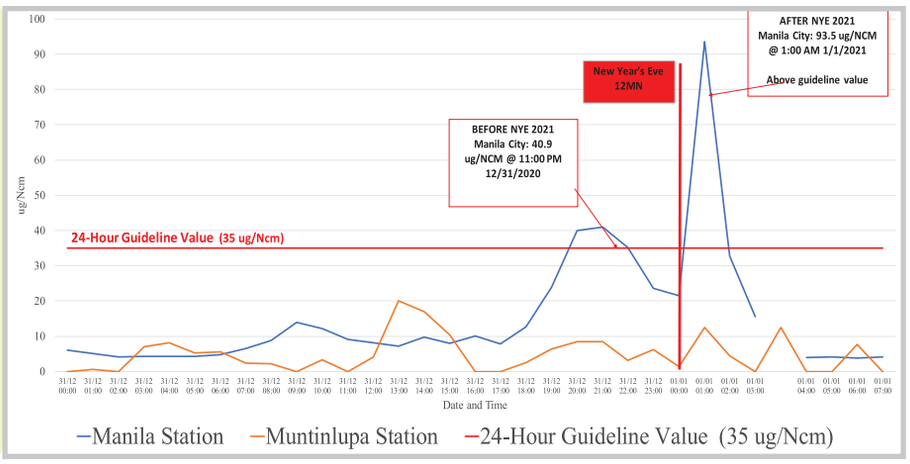


Figure 4.13 Status of Metro Manila during New Year's Eve in PM 2.5

Air Quality on the other parts of the Country on New Year's Eve Particulate Matter 10 (PM_{10})

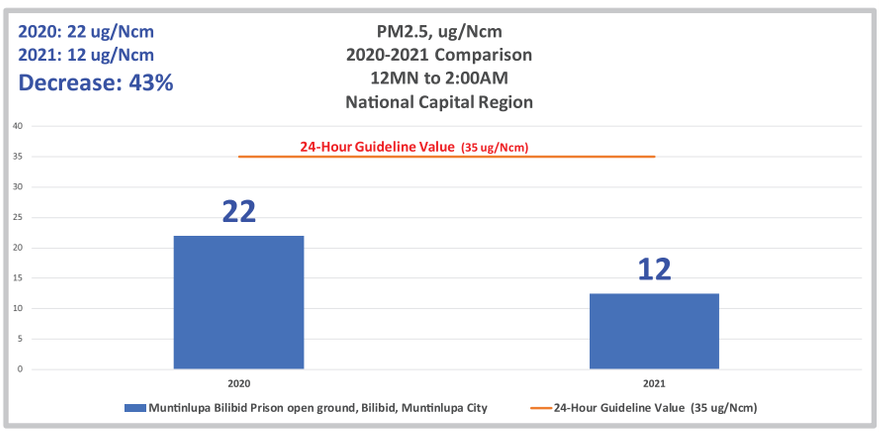


Figure 4.14 Comparison of the air quality in NCR in 2019 and in 2020 New Year's Eve

During the CY 2021 New Year's Eve celebration, a total of 13 stations and six stations measured PM10 and PM2.5 ambient air quality data outside the NCR, respectively. Koronadal City Station in South Cotabato measured a maximum of 166 µg/NCM PM10 during 12:00 MN to 2:00 AM on January 1, 2021 which is above the PM10 24-hour National Ambient Air Quality Guideline Value (NAAQGV) of 150 µg/NCM.

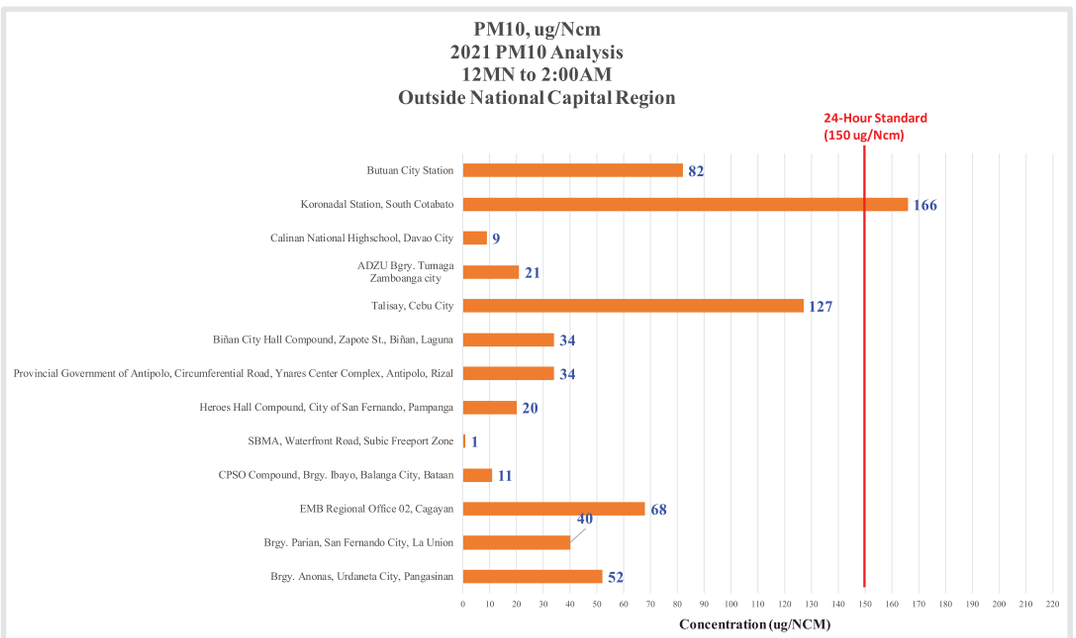


Figure 4.15 Air quality outside NCR during New Year's Eve in PM 10

Particulate Matter 2.5 ($PM_{2.5}$)

Three stations exceeded the 24-hour National Ambient Air Quality Guideline Value (NAAQGV) of 35 µg/NCM for $PM_{2.5}$.

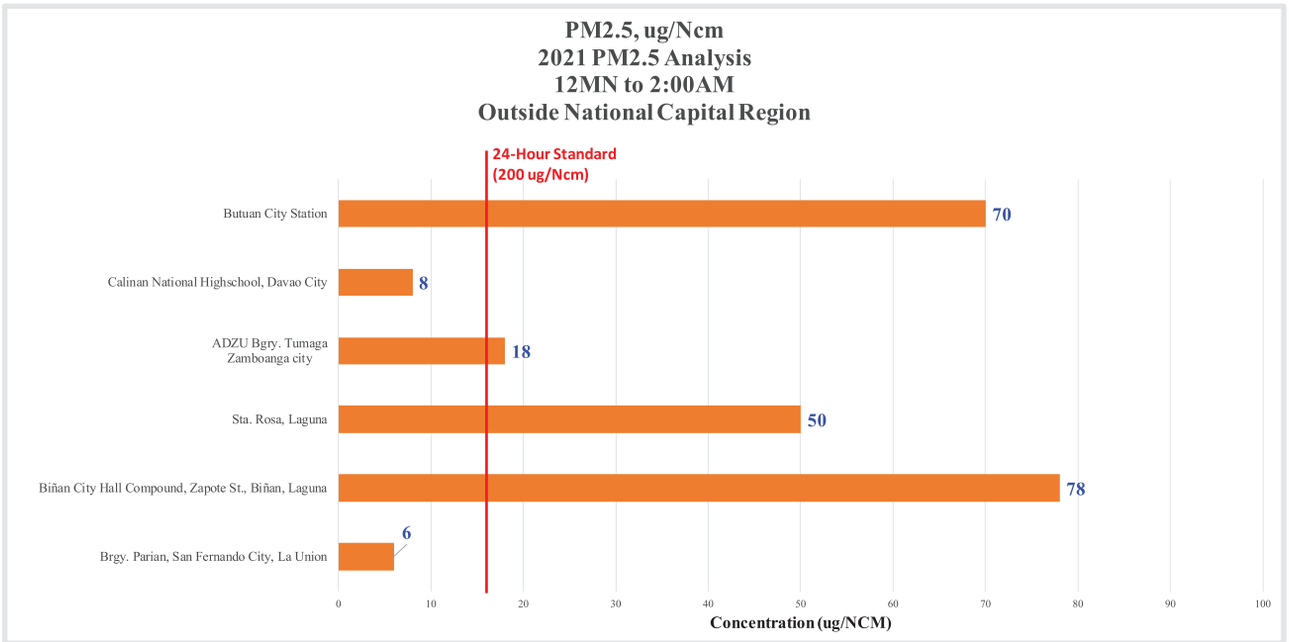


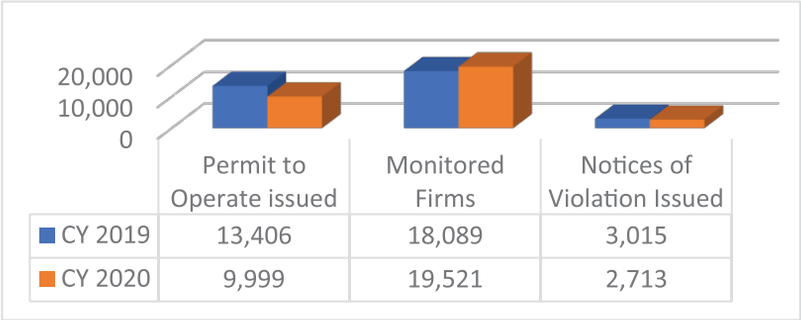
Figure 4.16 Air quality outside NCR during New Year's Eve in PM 2.5

Status of Air Quality Monitoring Stations Nationwide

As of December 2020, approximately 82% of the air quality monitoring stations are functional/operational while 18% are not operational or for repair / replacement. Some Manual-Reference Method Stations and Continuous Ambient Air Quality Monitoring Stations (CAAQMS) need human intervention and due to the strict implementation of Community Quarantine (CQ) in the Philippines brought about by COVID-19 Pandemic, some of them did not operate during the peak of CQ. Nonetheless the concentration of PM10 and PM2.5 both for Metro-Manila and Nationwide were significantly reduced due to the implemented lockdowns and less human activities during the CQ.

Figure 4.17 Ambient Air Quality Monitoring Station in San Fernando City, La Union (Region 1)

Compliance Monitoring of Firms



	Permit to Operate issued	Monitored Firms	Notices of Violation Issued
CY 2019	13,406	18,089	3,015
CY 2020	9,999	19,521	2,713

Figure 4.18 *Data on compliance of firms for air quality*

Stricter monitoring of stationary sources of pollutants, especially from major industries, was also undertaken. *Figure 4.18* shows that out of the 19,521 firms monitored, 2,713 or 14% were found to have violated the standards. Percentage of compliance was at 83% in 2019 and 86% in 2020.

Designation of Attainment and Non-Attainment Areas in an Airshed

Airsheds are established in order to oversee the planning and implementation of air quality management policies and ensure strong coordination among government agencies and between government agencies and private sector / civil society. Based on the developed Airshed Assessment Checklist to check the level of compliance in terms of operationalization, seven Airsheds were classified as Category 1 or "Inactive Airshed" while the remaining 15 were classified as "Active Airshed". The original schedule of designation of attainment and non-attainment areas was hampered due to COVID-19 Pandemic. Contingency plan/action was requested from the Airshed Governing Boards as a countermeasure to address the impact of the implemented community quarantine nationwide.

Ways Forward

- Compliance Monitoring of Firms/Industries
- Monitoring of harmful pollutants to come up with a comprehensive analysis of air quality in Metro Manila and other major urban cities (Maintain/Operationalize the Air Quality Automatic Monitoring Stations in major urban cities nationwide)
- Garage Testing and Technical Assistance through free emission testing and IEC on fuel efficiency and management and regular maintenance
- Monitoring of Private Emission Testing Center (PETC)
- Designation of Airsheds and operationalization of their Governing Boards
- Establishment of Air Quality Monitoring Network Center (On-process)

Proposed Policies for FY 2021

- Guidelines in the Implementation of Stationary Source Mass Emission Rate Standards (MERS) - Phase 1
- Guidelines on Ambient Air Quality Guideline Values / Standards for Hazardous Air Pollutants - Phase 2
- Manual of Air Pollution Source Installation (APSI)
- Guidelines on Online Submission of Test Plan, Emission Test Results, RATA and Ambient Air Quality Results
- Development of Local Emission Factors for Emission Inventory Improvement
- Guidelines on Emission Charge System Pursuant to Section 5 of DAO 2000-81
- Guidelines on ETV for Locally Developed Air Quality Monitoring Instruments
- Guidelines on Data Handling of Gaseous Ambient Air Pollutants
- Guidelines on CEMS / COMS Audit Service Providers
- Guidelines on Management of Idling of Vessels in Relation to Marine Air Pollution
- Improvement of Online Web-based Emissions Inventory Data Bank - Phase 2.

(Source: EMB 2020 Annual Report)