clarity

Tracking Air Quality for Healthy and Liveable Cities

Liveable Cities Lab on “Tech and the City”
December 12, 2024 [2:00 to 4:30 PM via Zoom]

Ethel Garcia

Regional Account Manager – Southeast Asia and Oceania

Agenda

1. Introduction
2. Air Pollution and its Health Impact
3. Clarity Movement - Who We are and What We Do
4. Our Technology and Approach to Air Monitoring
5. Our Impact — Partnerships & Success Stories
6. Challenges and Learnings
7. A Case in Progress for Metro Manila
8. Closing Thoughts

The INVISIBLE KILLER

8.1 Million deaths worldwide in 2021

700k deaths are children under 5

58% of deaths due to Ambient PM2.5

99% of world's urban population breathe polluted air

11 SUSTAINABLE CITIES AND COMMUNITIES

MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

The Ticking Time Bomb: Air Pollution in the Philippines

>60K deaths

Air pollution is linked to >60K premature deaths annually in Metro Manila

P4.5 Trillion

Annual economic cost of air pollution in the Philippines (2019)

30% Deaths

30% of deaths due to air pollution are children under 5yo in PH

10 Years of Clarity Movement

We are on a **mission** to empower the world to **reduce air pollution**

85+
countries with sensors

250+
cities using Clarity

10K+
unique deployments

500M+
air quality measurements

A globally adopted solution

Providing a fully integrated air quality monitoring solution

Sensing-as-a-Service℠

Clarity Node Platform

Measures all key air pollutants

- Solar-powered
- Cellular-connected
- Easily installed within 5 minutes

Clarity Cloud

Cloud-based data analysis

- Natively-integrated IoT dashboard
- Secure data pipeline & storage
- Powerful APIs, analytics and visualization

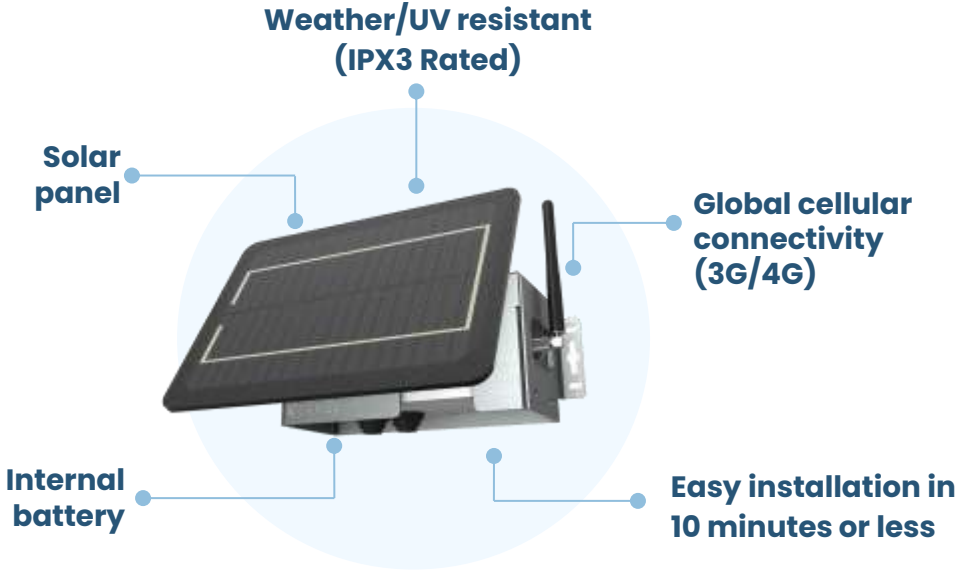
Clarity Expert Support

Scalable project support

- Highly qualified air quality experts
- Accurate and reliable data through Remote Calibration
- Responsive project management enabled by modern software stack

Clarity Node-S

A resilient, independently powered, and cellular-connected air monitor



Measures **PM** and **NO2**.

MCERTS, FCC & CE certified and designed for **easy deployment** everywhere, and **reliable operation** in adverse weather conditions.

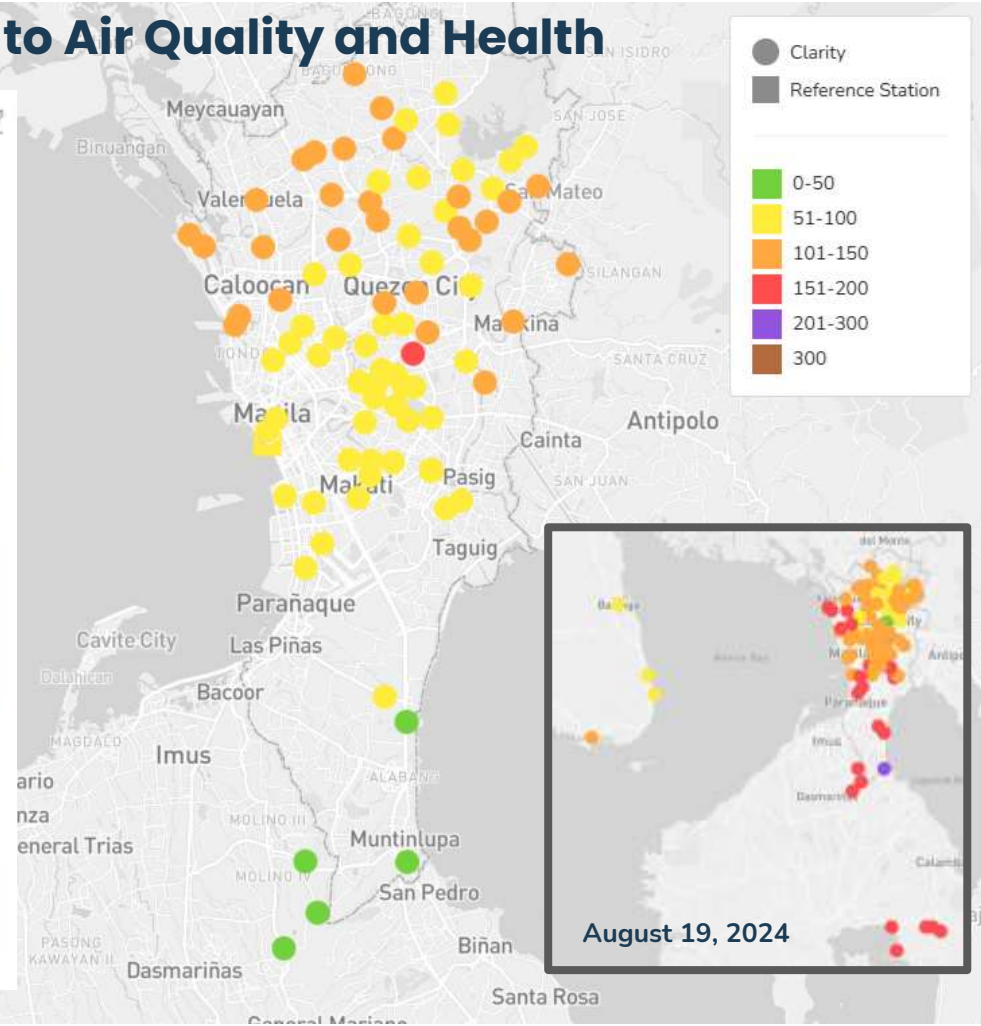
Decoding Air Quality Index: A Guide to Air Quality and Health

Ano ang Air Quality Index?

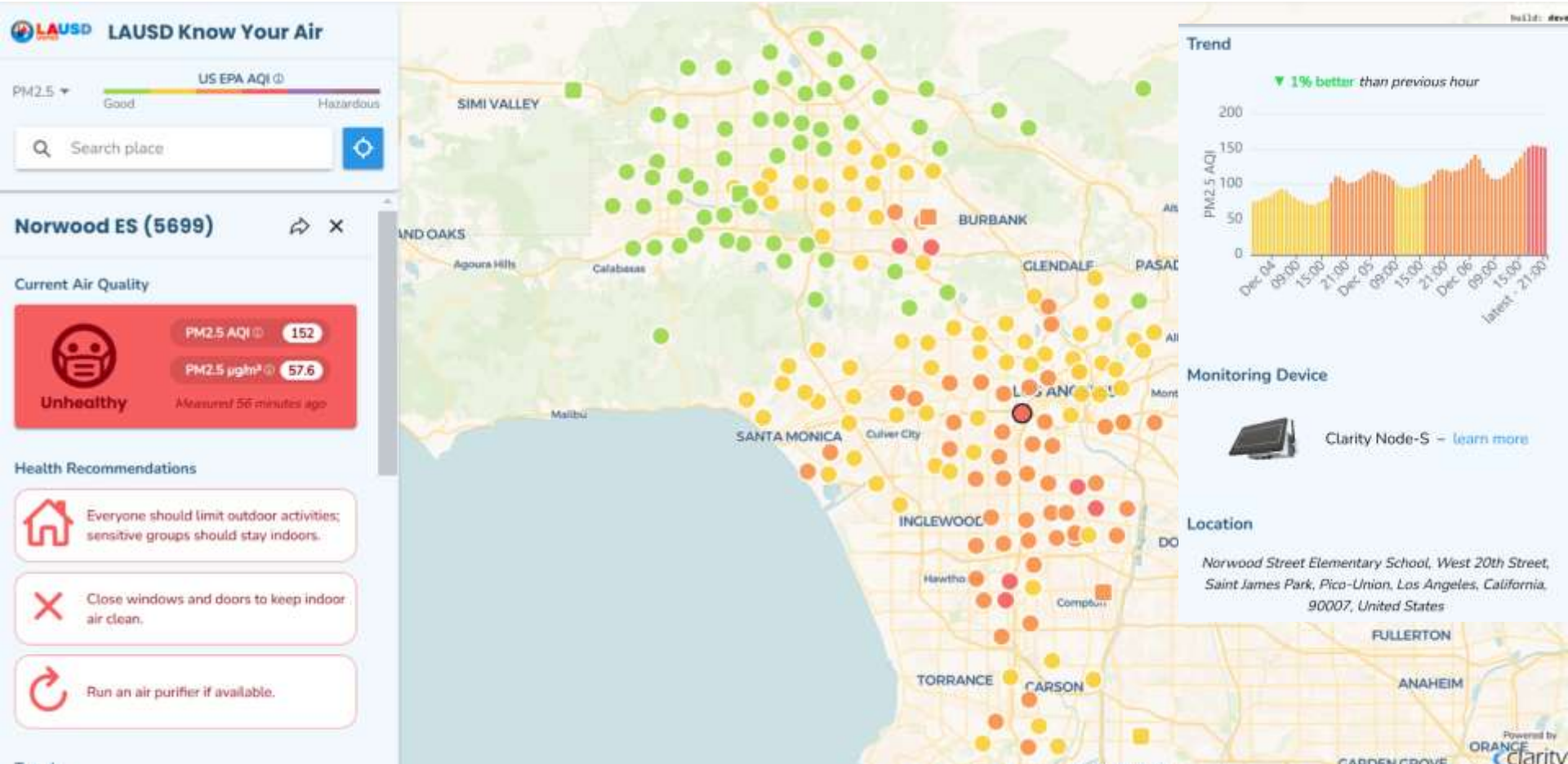
Ang AQI ay ginagamit upang malaman ang air quality at mga paalala upang maiwasan ang masamang epekto dulot nito sa kalusugan ng tao.

Good	- Walang babala
Fair	- Walang babala
Unhealthy for Sensitive Groups	- Iwasang lumabas kung mayroong respiratory disease tulad ng hika.
Very Unhealthy	- Iwasang lumabas ng bahay at limitahang gumamit ng sasakyan - Iwasan ang lugar na may matinding traffic - Manatili at magpahinga sa bahay kung may heart/respiratory disease
Acutely Unhealthy	- Iwasang lumabas ng bahay. Manatili at magpahinga kung may heart/respiratory disease - Maaaring limitahan ang paggamit ng sasakyan at bawasan ang mga gawaing pang industriya.
Emergency	- Ang lahat ay dapat manatali sa loob ng bahay - Ipinagbabawal ang pagbiyahe ng sasakyan maliban kung medical o emergency ang dahilan - Kailangang bawasan ang mga gawaing pang-industriya maliban kung makakaapekto sa kalusugan at kaligtasan

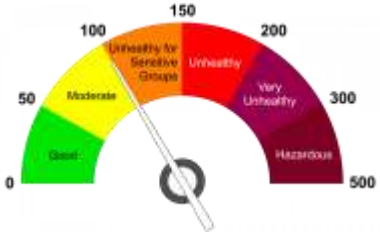
Credits: AQI Infographics from Quezon City Government



Decoding Air Quality Index: A Guide to Air Quality and Health



Lahore's air quality spikes to 1,067 under 'dangerous' category, new record high



Lahore, Pakistan's second-largest city, is grappling with unprecedented air pollution levels. Authorities implement emergency measures as residents face heightened health risks.

Our Impact – Partnerships and Success Stories

Quezon City, Philippines

Number of Clarity Nodes:

8	→	40
June 2021		Dec 2023

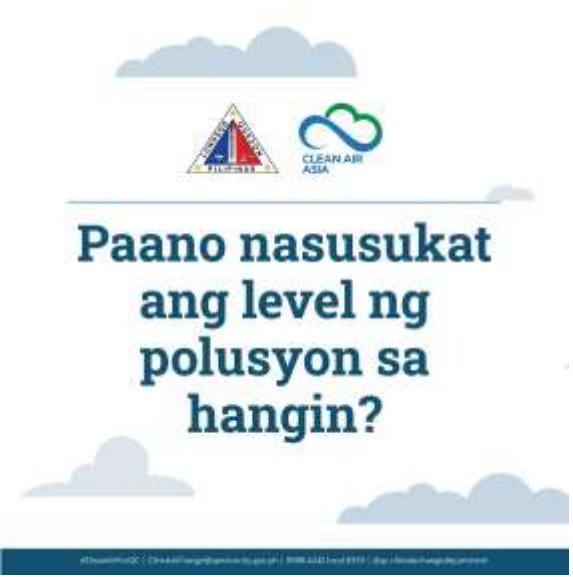
"We are advancing steadily to the attainment of cleaner air for our citizens as promised. Having real-time air quality data across the city can lead to more specific air quality management actions and decisions – identifying sources and locations we need to focus on while providing guidance on health exposure of our citizens through the air quality index."

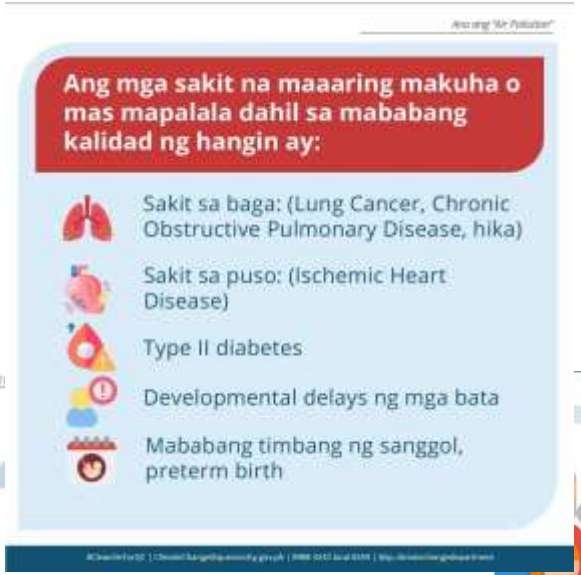
JOSEFINA BELMONTE
Mayor, Quezon City

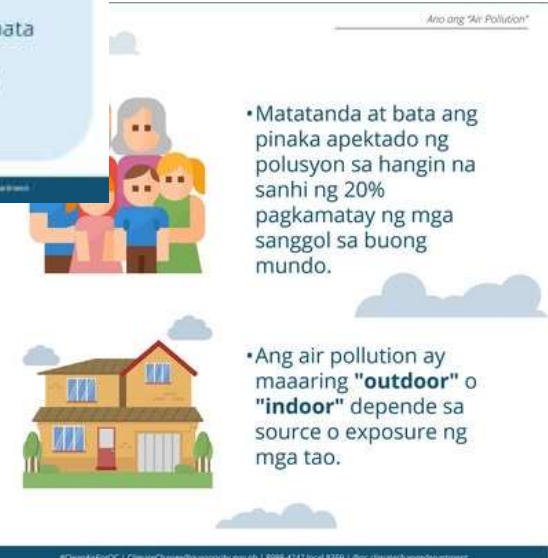
Action Enabled:

Improve air quality with targeted policies

Community Engagement and Public Awareness







Credits: Infographics from Quezon City Government

Community Engagement and Public Awareness

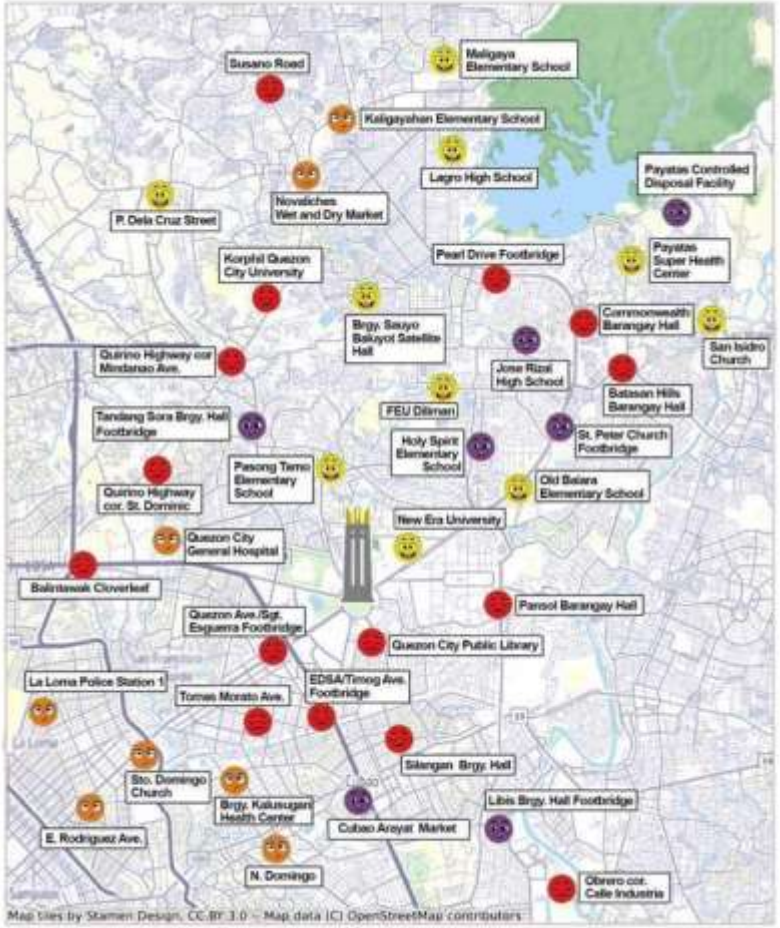
Air Quality in Quezon City

24 Hour PM $_{2.5}$ AQI
12NN October 09 to 12NN October 10, 2024

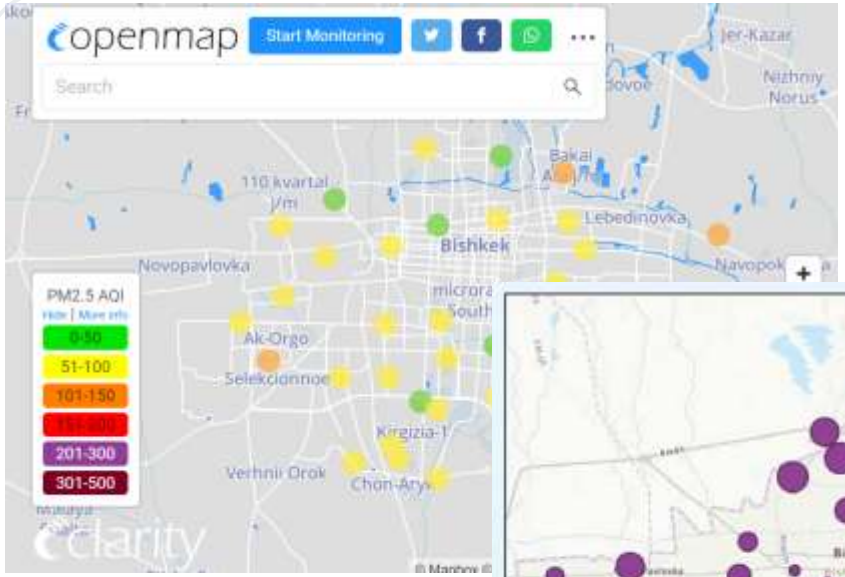
Air Quality Index (AQI)

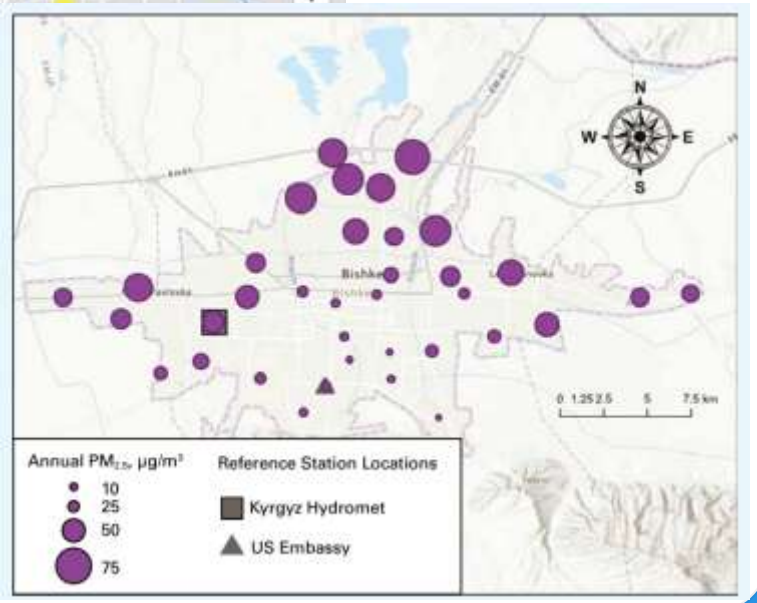
Ang AQI ay ginagamit upang malaman ang air quality at mga paalala upang maiwasan ang masamang epekto na dulot nito sa kalusugan ng tao.

Good	(0 - 25 ug/m³)	- Walang babala.
Fair	(25.1 - 35.0 ug/m³)	- Walang babala.
Unhealthy for Sensitive Groups	(35.1 - 45.0 ug/m³)	- Iwasang lumabas kung mayroong respiratory disease tulad ng hika.
Very Unhealthy	(45.1 - 55 ug/m³)	- Iwasang lumabas ng bahay at limitahang gumamit ng sasakyan. - Iwasan ang lugar na may matinding traffic - Manatili at magpahinga sa bahay kung may heart/respiratory disease.
Acutely Unhealthy	(55.1 - 90 ug/m³)	- Iwasang lumabas ng bahay. Manatili at magpahinga kung may heart/respiratory disease. - Maaaring limitahan ang paggamit ng sasakyan at bawasan ang mga gawaing pang industriya.
Emergency	(Above 91 ug/m³)	- Ang lahat ay dapat manatili sa loob ng bahay. - Ipinagbabawal ang pag byahe ng sasakyan maliban kung medical o emergency ang dahilan. - Kailangang bawasan ang mga gawaing pang-industriya maliban kung makakaapekto sa kalusugan at kaligtasan.



Our Impact – Partnerships and Success Stories





40.3%

Of domestic energy production is coal- fuelled nationally and 57% of the population of Bishkek heat their homes with coal.

Bishkek, Kyrgyzstan

Number of Clarity Nodes: **50**

"In 2020, we installed 50 sensors in the city of Bishkek. We placed some of them near roads, some in residential areas, and some in social facilities. Thanks to the Global SIM Card which is incorporated in the sensors, we get the data directly to our system which allows us to visualize the data. The data is ready for analysis."

BEGAIM ALIPOVA
Kyrgyz Hydromet

Action Enabled:
Improve air quality with targeted policies

Establishing a data-driven clean air initiative

Impacts on City Livability

Public Health and Climate Change

The most glaring impact of Bishkek's poor air quality on the city's livability is the reduced access of its resident to a healthy urban environment. Long-term exposure to high concentrations of particulate matter puts residents' health and safety at risk.

Public Health

The most vulnerable groups are young children who are still going through lung development, individuals with pre-existing health conditions, and the elderly.

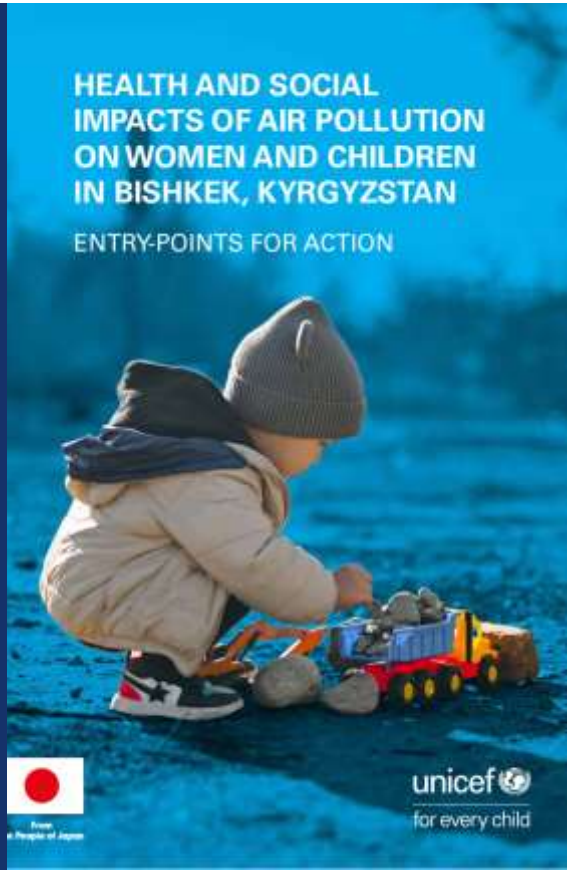
The two most problematic pollutants in Bishkek are $PM_{2.5}$ and NO_2. Direct health impacts from $PM_{2.5}$ exposure include premature death, acute upper respiratory infections, and non-fatal heart attacks. NO_2 adverse health outcomes include respiratory disease and asthma.

Climate Change

GHG emissions from fossil fuel combustion negatively impact climate change.

Particulate matter components can have warming or cooling effects on the climate.

Ozone in the atmosphere warms the climate. Ozone is not currently measured in Bishkek, and its impact is neglected.



AQM: Challenges and Opportunities

Challenges in Scaling Air Quality Monitoring

Scaling Up

Data Reliability

Data Sharing

Opportunities for Growth and Impact

Collaborations & Partnerships

Community Engagement

Behavioral Change

Innovation

Lessons Learned: Success Factors in AQM

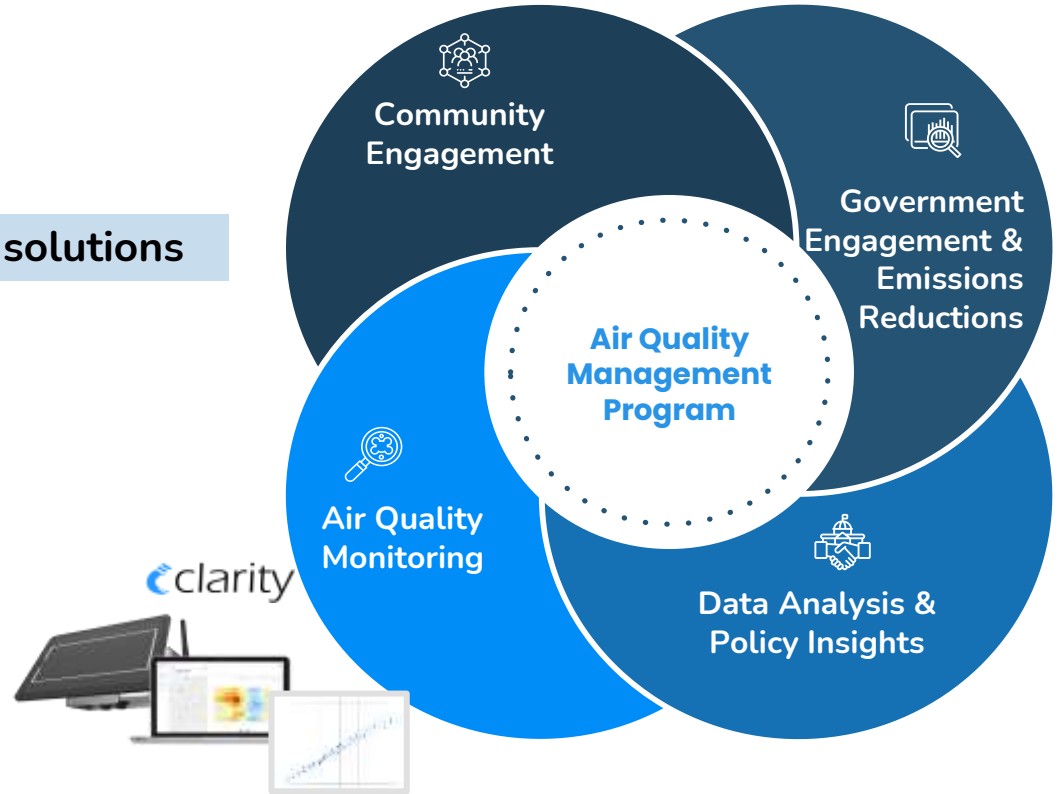
01 Know your objectives

02 Select the right air monitoring solutions

03 Analyze the data

04 Engage with community

05 Engage with regulators



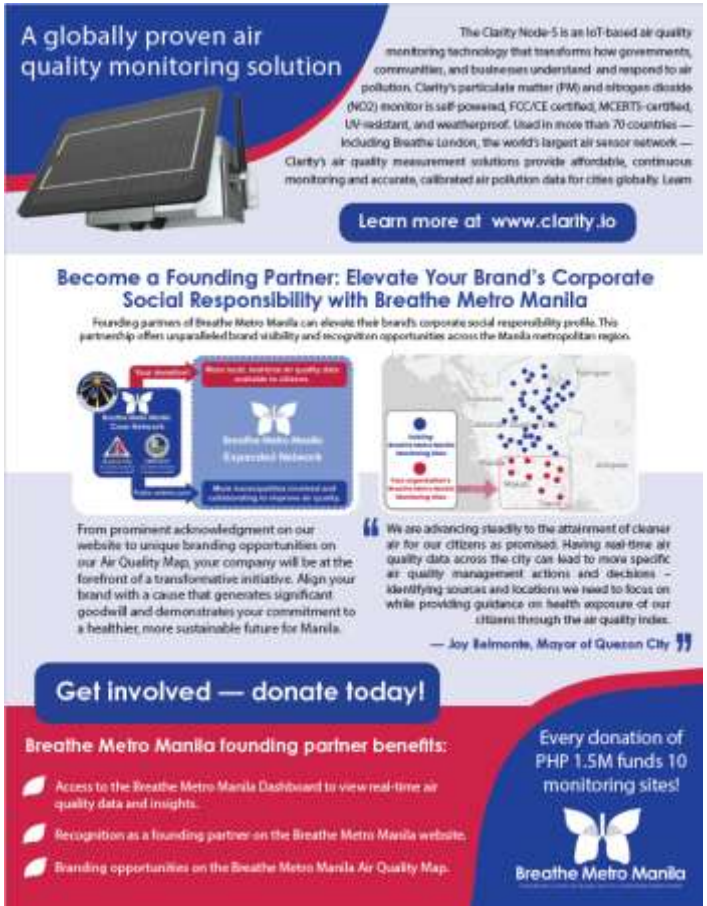
From Data to Impact: A Case in Progress for Metro Manila

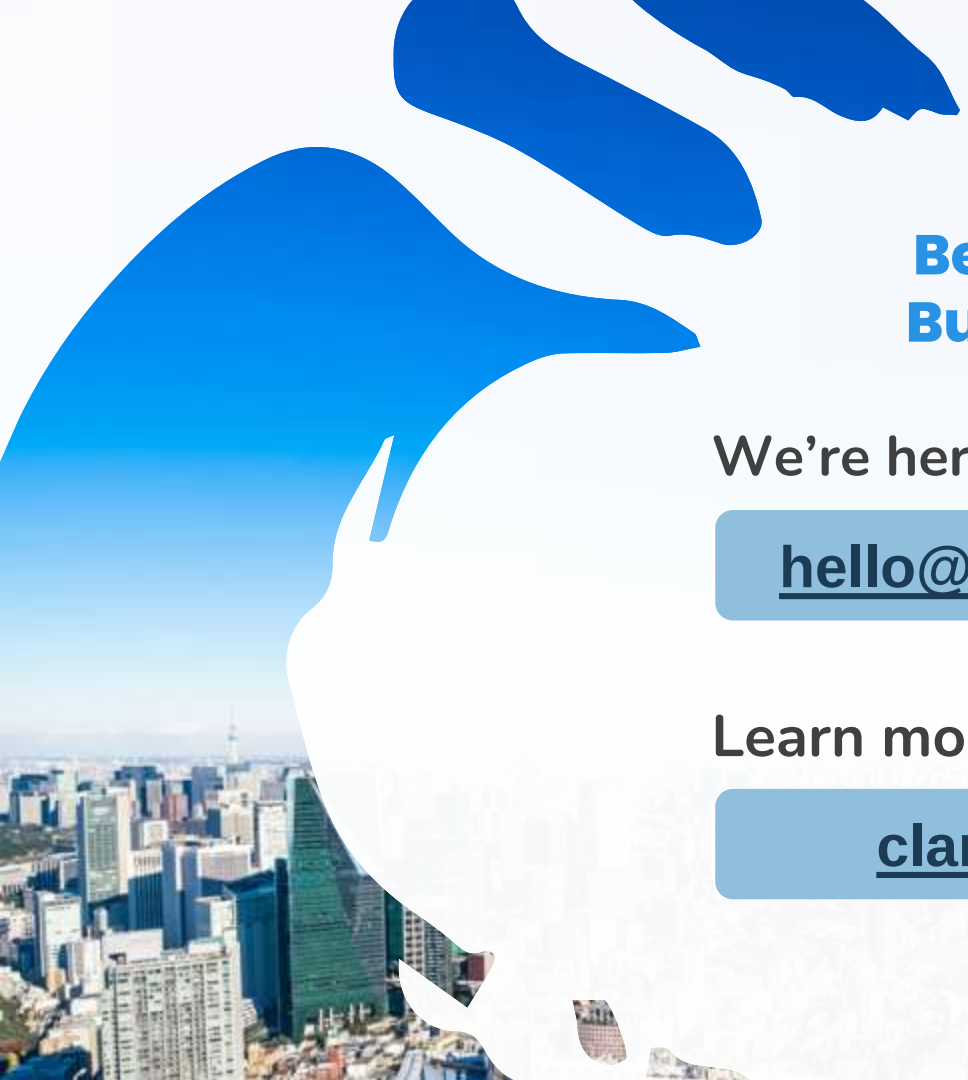
Scaling Up through Public & Private Sector

Driving Change through Data

Empowering the Stakeholders: LGUs, Businesses, General Public

From Data to Action: leveraging the use of data for policies and efficient use of resources





Be Part of the Change: Join us in Building Healthier Communities

We're here to answer any questions!

hello@clarity.io

ethel@clarity.io

Learn more on the Clarity website

clarity.io

clarity