Power BI Project Report

# Title

Air Quality Index (AQI) Analysis: India and Global Comparison Using Power BI

# Toolkit Used

- Power BI Desktop: For dashboard design and interactive data visualization  
- Bing Maps / OpenStreetMap Integration: For geolocation-based plotting  
- Datasets:  
 - Indian cities AQI data (25 cities)  
 - International country-wise AQI  
 - Pollutants: CO2, NO2, SO2, NH3, PM2.5, PM10  
 - Timeline: 2021–2025

# Abstract

This project visualizes AQI (Air Quality Index) data across major Indian cities and compares it with international AQI readings to understand pollution patterns.   
It provides an analytical perspective on how air quality has changed over the years and offers interactive dashboards for stakeholders to explore CO2, NO2,   
and other pollutant levels in specific regions and timeframes. The use of Power BI facilitates data-driven environmental awareness and policy decision-making.

# Key Dashboard Features

1. Year-wise AQI Comparison:  
 - Trends from 2021 to 2025  
 - Breakdown by country and city  
 - Highest AQI values over the years  
  
2. City-wise Pollution Visualization (India):  
 - Covers 25 major cities  
 - Measures CO2, NO2, SO2, NH3, PM2.5, PM10 levels  
 - Maximum CO2 Level: Bengaluru - 2,483.37 µg/m³ (April 2022)  
  
3. Global AQI Insights:  
 - Countries like Algeria, Bangladesh show high AQI  
 - Uses map visuals for international comparison  
  
4. Detailed Pollutant View:  
 - Per city statistics:  
 - Median of NH3  
 - Max of NO2 / SO2  
 - Min of PM10  
 - Average of PM2.5  
 - Data filters for year, city, pollutant type  
  
5. Advanced Insights:  
 - Predictive pattern observation (trends and peaks)  
 - Identification of most polluted cities

# Objectives

- Assess AQI fluctuations over multiple years  
- Detect high-pollution zones (cities/countries)  
- Enable comparative environmental analysis  
- Empower public health planning with data

# Conclusion

This Power BI project delivers crucial insights into India’s air quality alongside international benchmarks.   
It highlights rising pollution concerns and supports environmental planning with rich data visuals.   
The combination of geographical mapping and pollutant-level tracking makes it a powerful analytical tool.

# Future Scope

- Real-time AQI data integration  
- Machine learning for pollution prediction  
- Mobile-friendly dashboards  
- IoT sensor-based AQI tracking

This project visualizes air quality trends in 25 Indian cities and globally from 2021–2025 using Power BI. AQI and pollutant data from CSV files were cleaned, transformed, and visualized. Interactive dashboards provide insights into pollution levels (CO2, NO2, PM2.5, etc.), aiding environmental awareness and policy planning.

* Bengaluru recorded the highest CO2 level (2,483.37 µg/m³) in April 2022 among Indian cities.
* Countries like Algeria and Bangladesh consistently show high AQI levels globally.
* AQI trends from 2021 to 2025 reveal seasonal pollution peaks and gradual fluctuations.
* Pollutant analysis highlights NH3 median and NO2/SO2 maximum values as critical markers for city-wise pollution severity.
* Identification of the most polluted cities helps prioritize targeted environmental interventions.