VIETNAM INSTITUTE OF HYDROLOGY, METEOROLOGY AND CLIMATE CHANGE

# EANET Training on Air quality monitoring system using LCS

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# Collaboration with ACAP/EANET on LCS studies

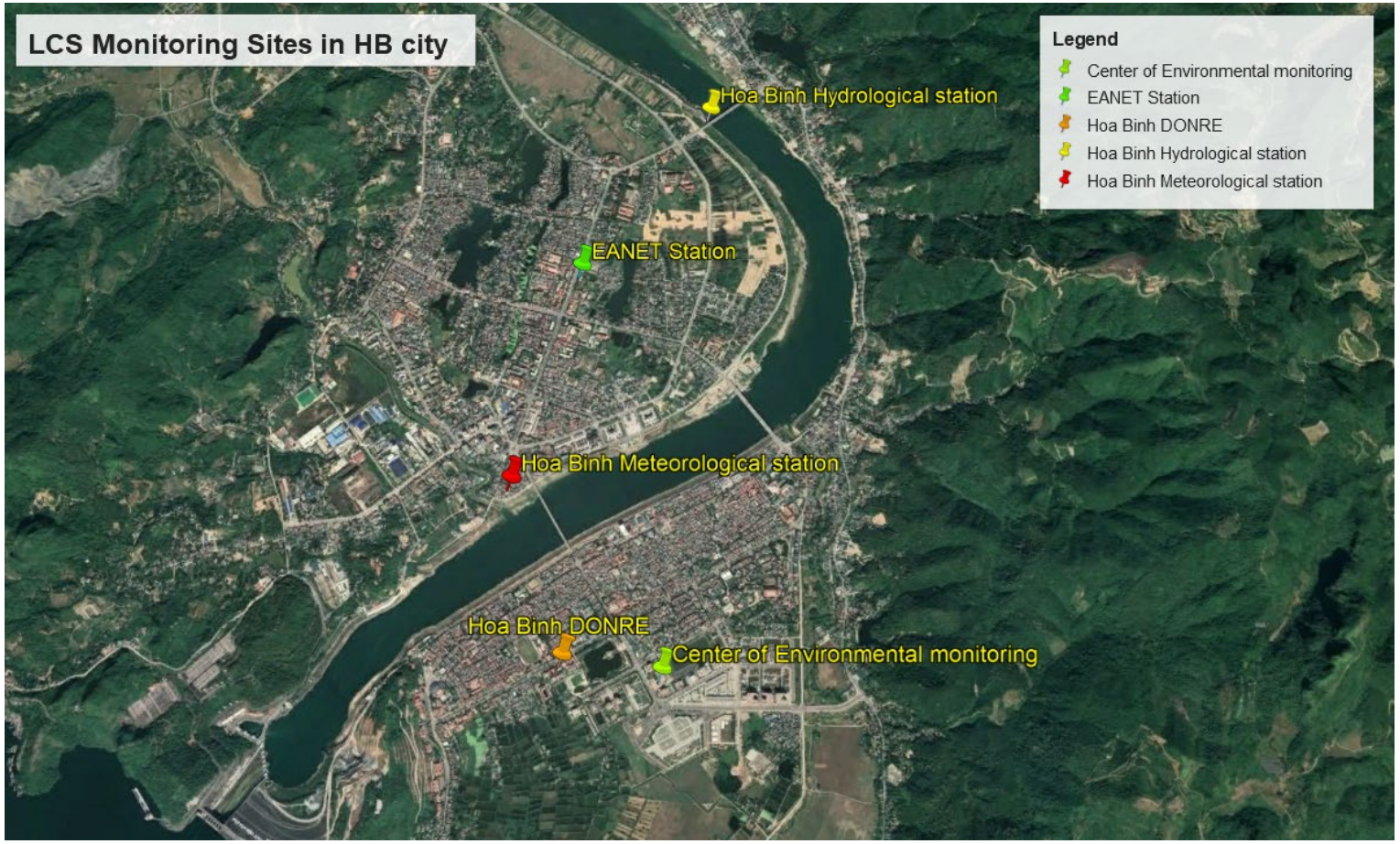
**LCS study in Hoa Binh city (EANET project)**

- Duration:

Phase 1: Nov. 2022 - Mar. 2023

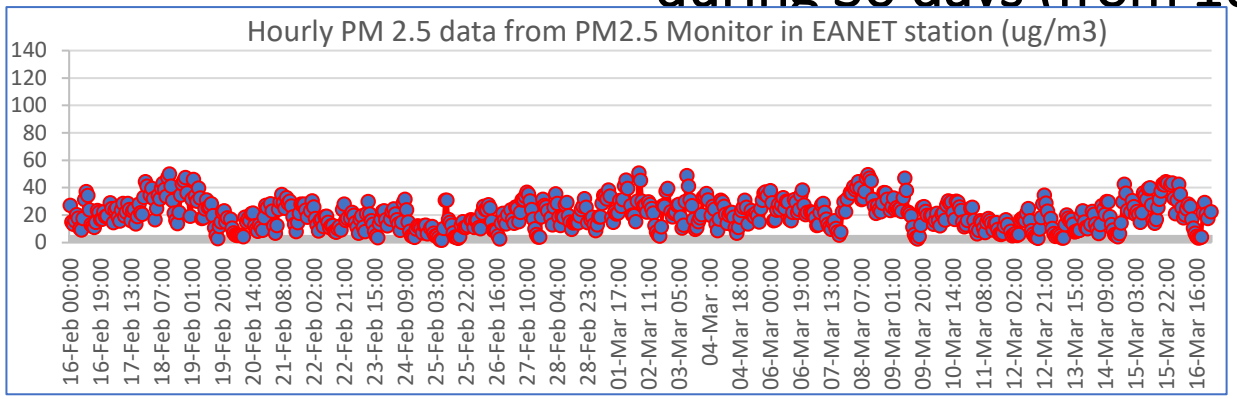
Phase 2: May 2023 – Dec. 2024

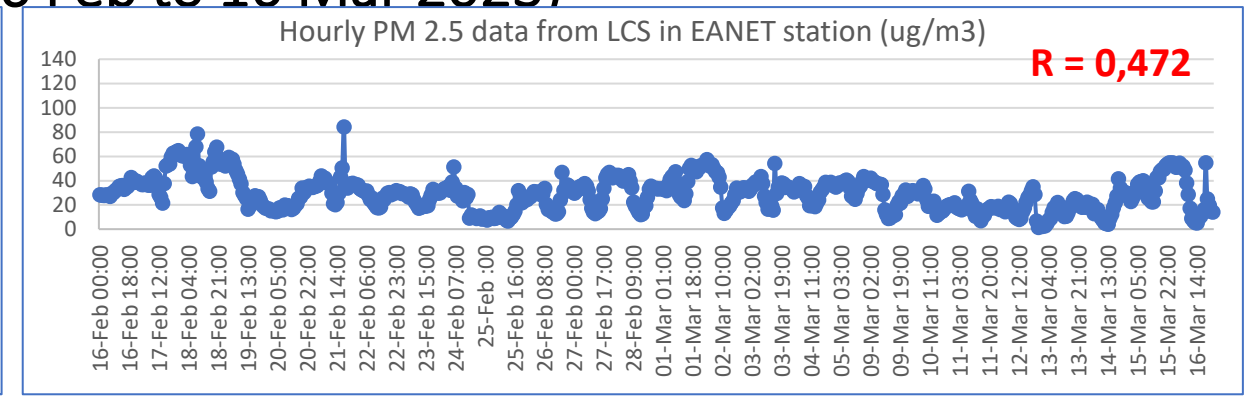
- No. of LCSs installed: 05
- Location: Hoa Binh city
- Parameter: $PM_{2.5}$

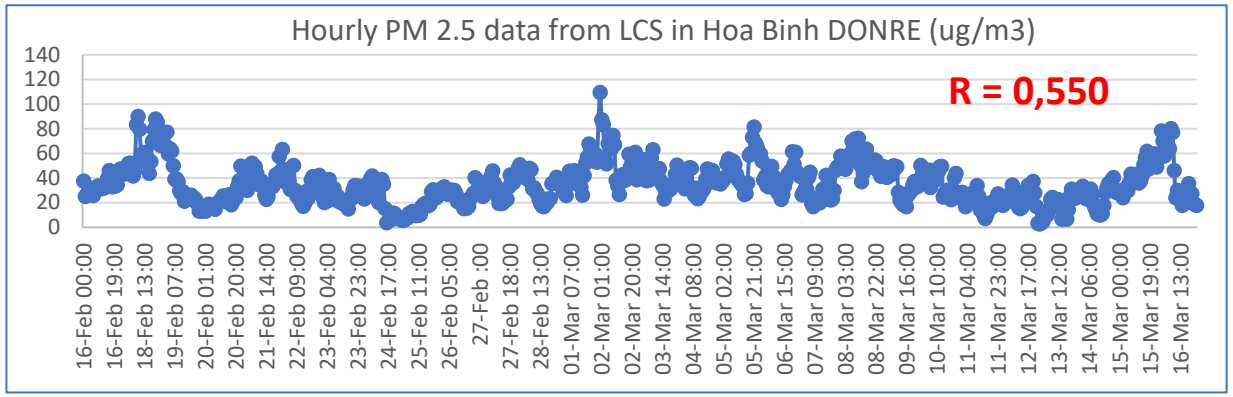


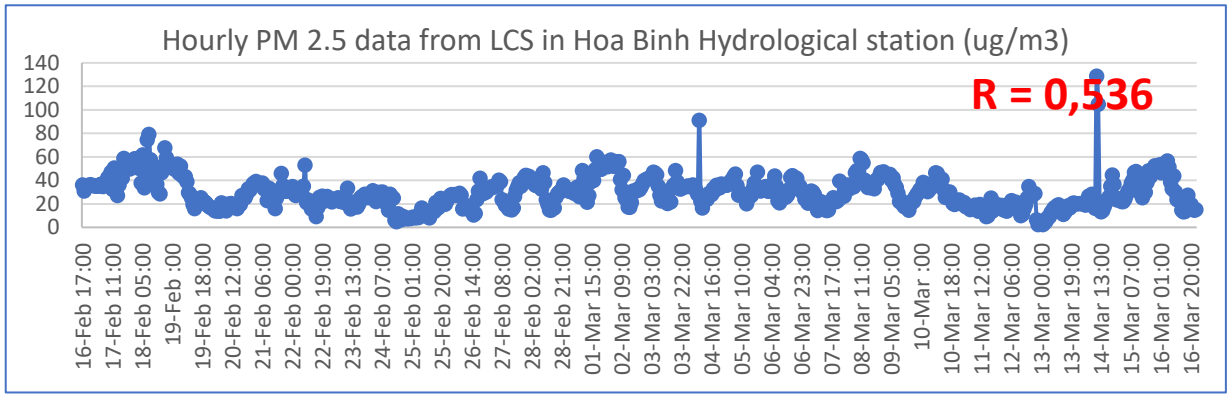

**Location of LCSs installed in Hoa Binh city**

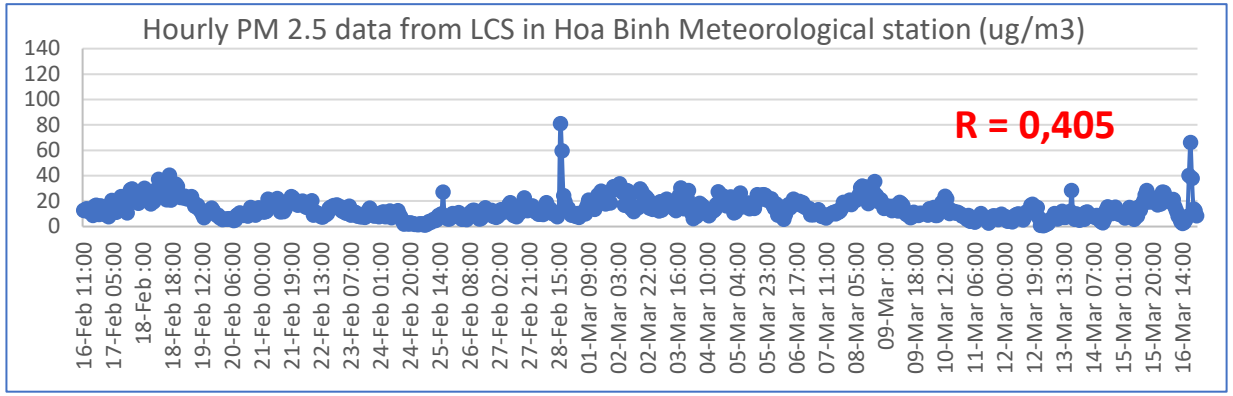
# Results on monitoring data from LCS in comparison with $PM_{2.5}$ monitor in Hoa Binh city during 30 days (from 16 Feb to 16 Mar 2023)

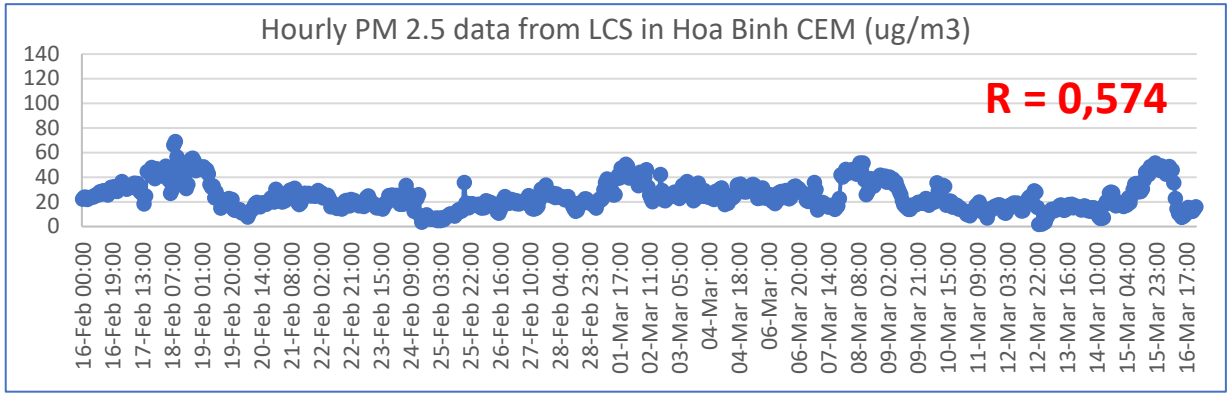


# Collaboration with ACAP/EANET on LCS

**LCS study in Ha Noi city (ADB project):**

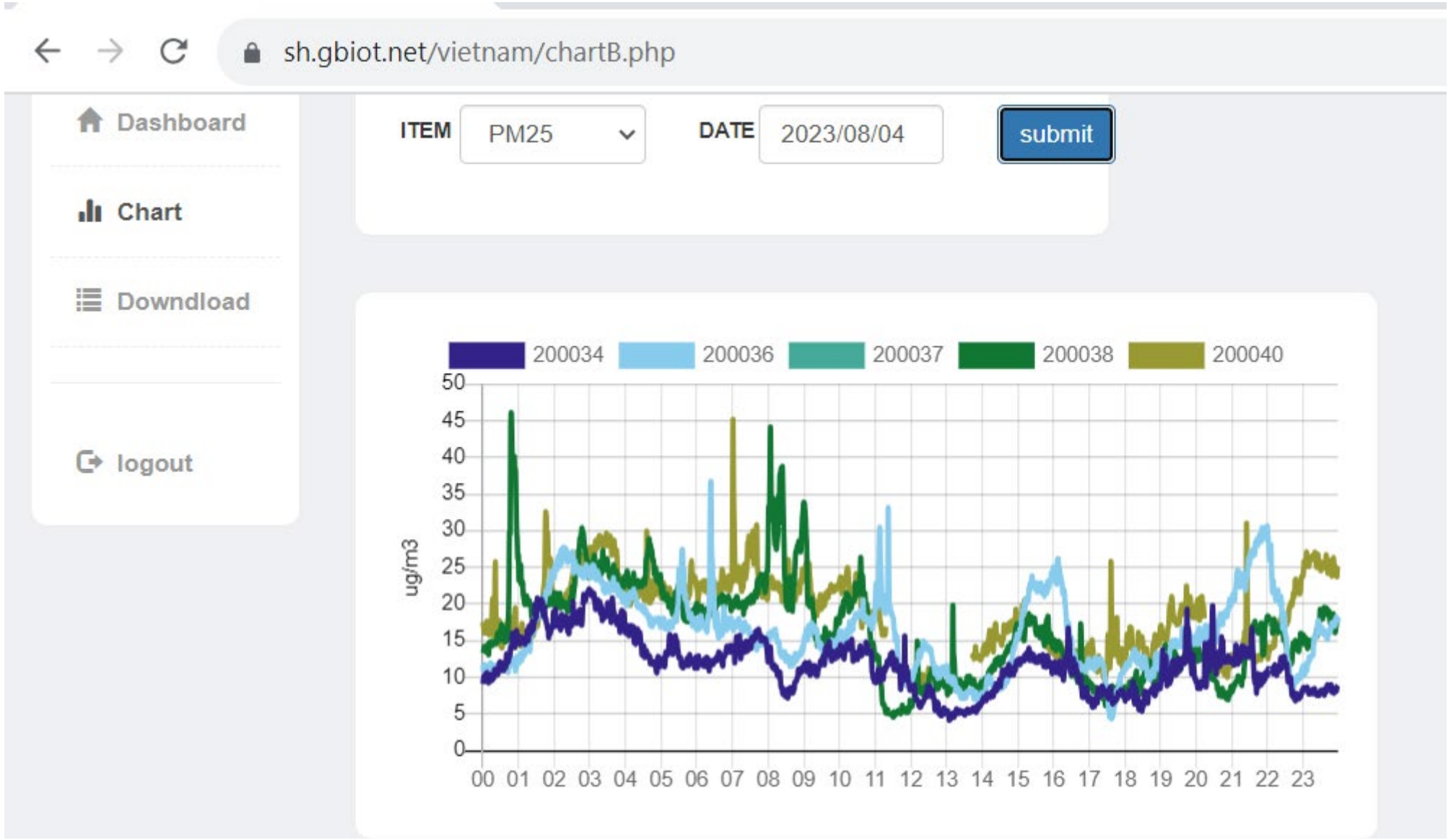
- Duration: May – Sept. 2023
- No. of LCSs installed: 5
- Location: Ha Noi city
- Parameters: $PM_{2.5}$, $N_2O$, $O_3$, Meteorological data

**Figure 2: Candidate sites of LCSs installed in Hanoi city**

# LCS study in Ha Noi city

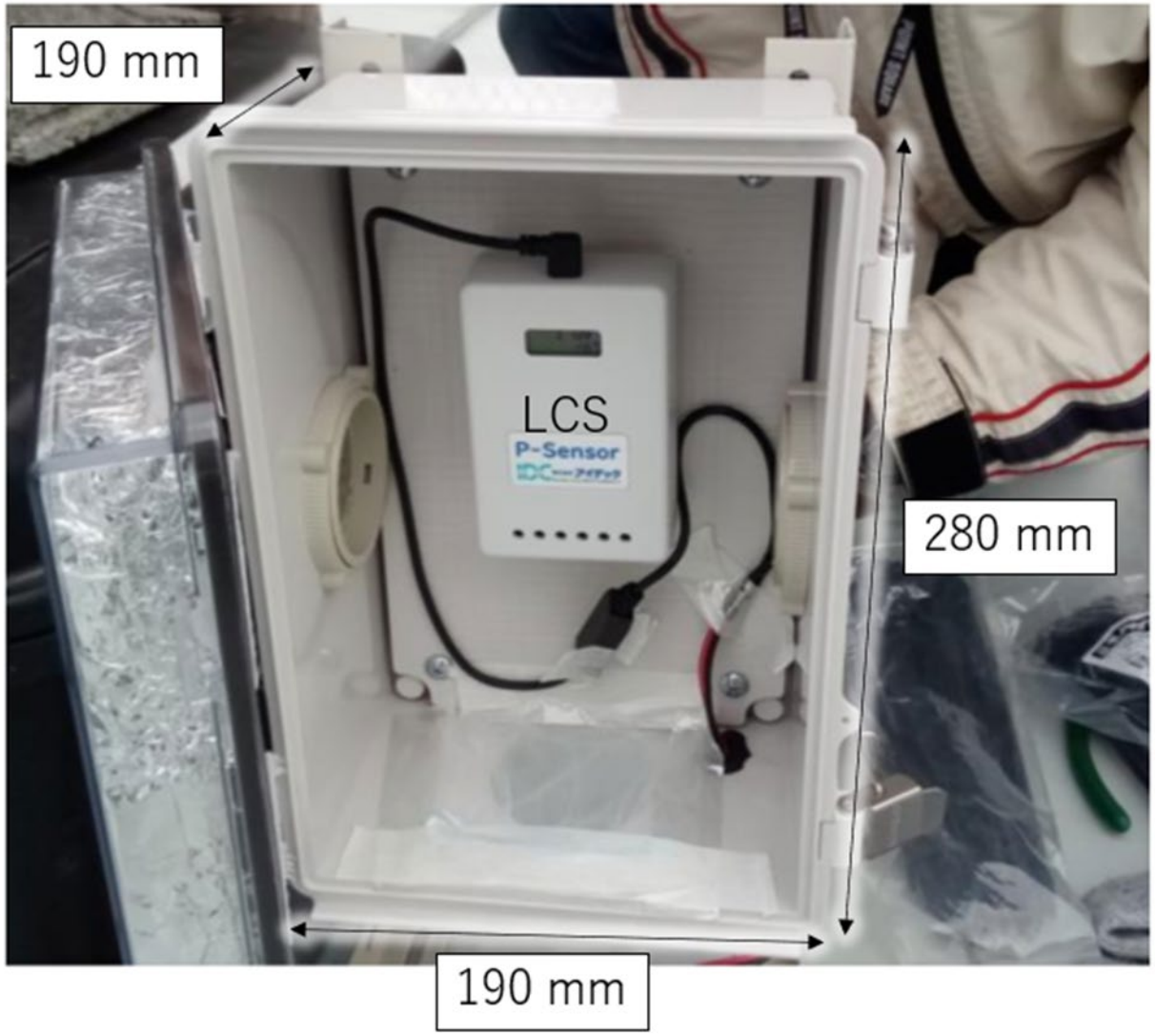
Monitoring duration from 29 July to 8 September 2023

# Online monitoring data from 5 LCS installed in Hanoi city



# Comments for LCS

- Accuracy verification
- Lifespan of LCS -> Cost- Benefit Analysis for regularly and continuously monitoring
- Maintenance and adjustment, verification during operation of lCS
- Integration with official AQM network



# Circular No. 10/2021/TT-BTNMT regulation on environmental monitoring techniques and management of environmental quality monitoring information and data

**Article 31. Requirements concerning technical specifications of automatic and continuous ambient air quality monitoring stations**

1. An automatic and continuous ambient air quality monitoring station shall use measuring equipment on **the list of monitoring methods and equivalent monitoring equipment published** by US Environmental Protection Agency **(US EPA)** or monitoring equipment **certified** by **international organizations** including Monitoring Certification Scheme For Equipment **(MCERTs)** and Technischer Überwachungsverein **(TÜV).**

# Circular No. 10/2021/TT-BTNMT

**Article 31. Requirements concerning technical specifications of automatic and continuous ambient air quality monitoring stations**

2. Technical specifications of automatic and continuous ambient air quality monitoring equipment must satisfy at least the following requirements:

| No. | Monitoring parameters | Measurement unit | Accuracy | | Measuring interval | Resolution | Response time |
|---|---|---|---|---|---|---|---|
| | | | (% of reading) | (% of measuring interval) | | | |
| 1 | Temperature | °C | ± 5% | ± 5% | 0 ÷ 80°C | 0,1 | ≤ 120 seconds |
| 2 | $NO_2$ | µg/Nm³ | ± 5% | ± 5% | 0 ÷ 500 | 0,1 | ≤ 300 seconds |
| | | ppb | ± 5% | ± 5% | 0 ÷ 250 | 0,1 | |
| 3 | CO | µg/Nm³ | ± 5% | ± 5% | 0 ÷ 100.000 | 0,1 | ≤ 200 seconds |
| | | ppb | ± 5% | ± 5% | 0 ÷ 85.000 | 0,1 | |
| 4 | $SO_2$ | µg/Nm³ | ± 5% | ± 5% | 0 ÷ 1.000 | 0,1 | ≤ 200 seconds |
| | | ppb | ± 5% | ± 5% | 0 ÷ 400 | 0,1 | |
| 5 | $O_3$ | µg/Nm³ | ± 5% | ± 5% | 0 ÷ 500 | 0,1 | ≤ 200 seconds |
| | | ppb | ± 5% | ± 5% | 0 ÷ 250 | 0,1 | |
| 6 | $PM_{10}$ | µg/Nm³ | ± 5% | ± 3% | 0 ÷ 500 | 0,1 | ≤ 60 seconds |
| 7 | $PM_{2.5}$ | µg/Nm³ | ± 5% | ± 3% | 0 ÷ 150 | 0,1 | ≤ 60 seconds |