

Air Quality Report

Update on Status of Air Quality in 1st quarter 2018



PM 2.5 CONCENTRATION AND AIR QUALITY INDEX IN HANOI

Air pollution is likely to have a major impact on human health in Vietnam. Serious air pollution has increased rapidly in major cities and is now a major concern in a number of areas. In response to this situation, government, organizations, and individuals have made numerous efforts to improve air quality. In June 2016, the Government of Vietnam released the "National Action Plan for Air Quality Management Until 2020". This plan is designed to improve air quality and ensure people's well-being through controlling emissions and monitoring air pollution. As part of this plan, an additional 70 air quality monitoring stations will be installed throughout Hanoi.

To contribute to these efforts, GreenID publishes periodic reports on air quality to raise public awareness and contribute solutions and initiatives for air quality improvement. Follow up on these periodical reports, this report continues to analyze the monitored data, update the status of air quality in the two largest cities of Vietnam: Hanoi and Ho Chi Minh City in the 1st quarter of the year 2018. This analysis is based on data of U.S. Embassy in Hanoi and U.S. Consulate in Ho Chi Minh only. PM2.5 concentration and Air Quality Index (AQI) on an hourly base is measured on both locations and provides public access to the historical data. We also conduct the comparison between the air quality in 1st quarter of 3 most recent years. This comparison will help to understand the situation in the two main cities of Vietnam and the actions to take in order to improve the air quality.

As this report analyses one location per city, we do not confirm that the data obtained is fully representative of the city-wide air quality, we still expect more air monitoring stations to be established and hourly historical data needs to be provided. However, this report can give a warning about the air quality in the two most important cities of our country, and air pollutants can spread within a city is easy to notice.

In summary, the air quality in Hanoi in 1st quarter of 2018 remained in unhealthy level with the high level of PM2.5 in the air. The air quality in HCMC is still better than in Hanoi however when comparing the air quality in the same period in 2016, 2017 and 2018, the air quality in HCMC tended to worsen year-on-year.

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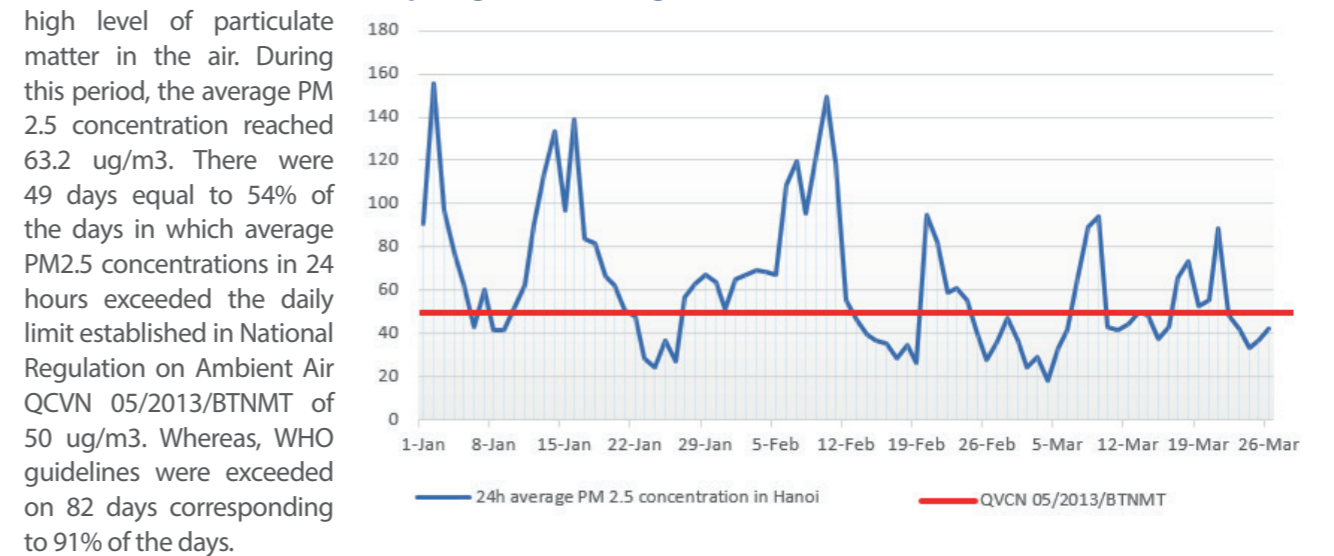
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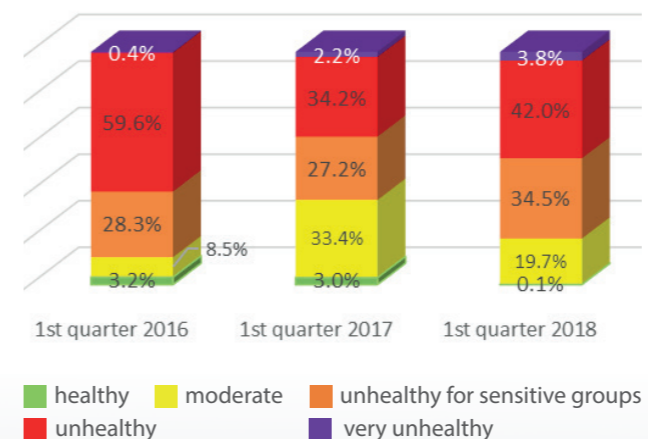
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Daily average PM 2.5 concentrations during 1st quarter 2018 comparing to national regulations in Hanoi



Hourly AQI level in 1st quarter during recent years in Hanoi



The Air Quality Index is the indicator for reporting daily air quality and is divided to 6 levels relating to health effects. We conducted the comparison the AQI data recorded at the U.S Embassy monitoring station throughout the three recent years (2016, 2017 and 2018) to track changes in the air quality year-on-year, an analysis of hourly averages was performed. Although there was an improvement of air quality in Hanoi in Q1-2017 compared to 2016, the unhealthy section had been reached on average 88% of the time, whereas it is reached on average 63.6% of the time in Q1-2017. However, the air quality tended to worsen again with the unhealthy sector accounted for about 80% of the time in Q1-2018.

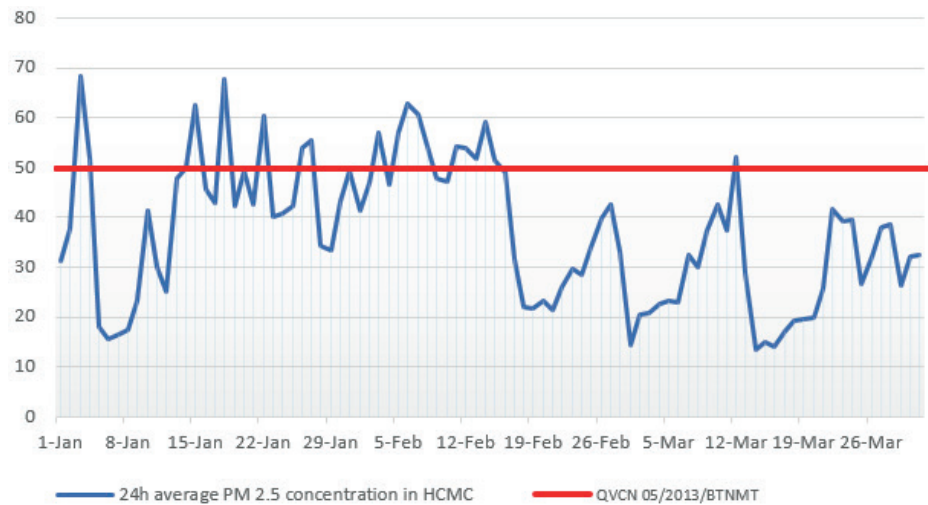
Overview on air quality in 1st quarter 2018 in Hanoi

Category	Total	Jan	Feb	March
Average AQI	137	151	145	120
Average AQI level	.	unhealthy	unhealthy for sensitive groups	unhealthy for sensitive groups
Average PM 2.5	63.2	76.1	69.0	47.6
Days violating national regulations	49	20	20	9
Days violating WHO regulations	82	27	27	28

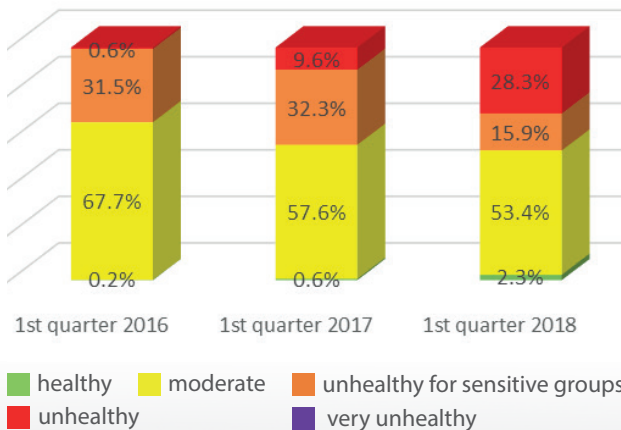
PM 2.5 CONCENTRATION AND AIR QUALITY INDEX IN HCMC

Air quality in Ho Chi Minh City compared favorably to air quality in Hanoi. In the 1st quarter of 2018, the average PM 2.5 concentrations reached 37.2 ug/m3. During this time, the daily average PM2.5 level were in violation of National Regulation on 18 days roughly 20% of the days, this figure in Hanoi was 49 days. However, they were up to 68 days in which WHO air quality guideline for PM 2.5 were exceeded.

Daily average PM 2.5 concentrations during 1st quarter 2018 comparing to national regulations in HCMC



Hourly AQI level in 1st quarter during recent years in HCMC



In Ho Chi Minh city, we also compared the AQI data recorded at the U.S Consulate monitoring station throughout the three recent years (2016,2017 and 2018) to estimate the change in the air quality year-on-year. Despite the fact that the air quality in HCMC is better than in Hanoi, it seems that the air quality tended to worsen. In the contrast to Hanoi, air quality in Ho Chi Minh city decreased during recent years, the number of hours which have the AQI in unhealthy sectors (with the AQI >100) gradually increased over the years from 32.1% in 2016 to 41.9% in 2017 and 44.2% in 2018.

Overview on air quality in 1st quarter 2018 in HCMC

Category	Total	Jan	Feb	March
Average AQI	102	109	114	85
Average AQI level		unhealthy	unhealthy for sensitive group	unhealthy for sensitive group
Average PM 2.5	37.2	41.3	42.6	37.2
Days violating national regulations	18	7	10	1
Days violating WHO regulations	68	26	24	18