

## ***0.a. Goal***

Goal 11: Sustainable and resilient urban and rural development; ensure a safe living and working environment; reasonable distribution of population and labor by region

## ***0.b. Target***

Target 11.6: Reduce harmful environmental impacts on people in cities, improve air quality management, urban waste and other waste sources (global 11.6 target)

## ***0.c. Indicator***

Indicator 11.6.3. Concentrations of substances in the atmosphere

## ***0.e. Metadata update***

June 2021

## ***1.a. Organisation***

Ministry of Natural Resources and Environment

## ***1.f. Contact mail***

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## ***1.g. Contact email***

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## ***2.a. Definition and concepts***

Concentrations of substances in the surrounding air are measured and observed technical parameters of some substances existing in the air. Substances typical for air quality include: Total suspended dust (TSP), PM<sub>10</sub>, PM<sub>2.5</sub>, carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen oxide (NO<sub>2</sub>), ozone (O<sub>3</sub>) and lead dust (Pb) in the ambient air.

- TSP: Are particles suspended in the air with an aerodynamic diameter less than or equal to 100µm. At high concentrations, TSP can cause effects on human health such as respiratory diseases, lung dust, tuberculosis,...;

- PM<sub>10</sub>: A type of dust with an aerodynamic diameter less than or equal to 10µm existing in the ambient air. This dust has the ability to penetrate deeply into the human body through the respiratory tract, causing diseases related to the respiratory tract;

- PM<sub>2.5</sub> : A type of dust with an aerodynamic diameter less than or equal to 2.5  $\mu\text{m}$  existing in the surrounding air environment, capable of penetrating deeply into the human body through the roadway. respiratory, causing diseases related to the respiratory tract;
- CO: A colorless, odorless, flammable and highly toxic gas; is the main product of incomplete combustion of carbon and carbon-containing compounds. Inhaling excessive amounts of CO can lead to hypoxemia or nervous system damage as well as possibly death;
- SO<sub>2</sub> : An inorganic gas, colorless, heavier than air; is one of the substances with high potential for environmental pollution, causing acid rain to corrode construction works, destroy flora, and cause desertification. In the gaseous form, SO<sub>2</sub> exceeds the allowable threshold and will cause pneumonia, eye, skin,... in humans;
- NO<sub>2</sub> : A colorless gas, causing greenhouse effect, generated during the burning of fossil fuels; It is a poisonous, reddish-brown color with an unpleasant odor. NO<sub>2</sub> is difficult to dissolve, so it can go deep into the lungs by inhalation, causing pneumonia and damaging alveolar cells;
- O<sub>3</sub> : Is an allotropic form of oxygen consisting of 3 oxygen molecules; is an unstable, degradable, corrosive substance and an environmental pollutant, at high concentrations, O<sub>3</sub> has the potential to cause cancer in some animal species;
- Pb: Lead particles that exist in the surrounding air as suspended dust, at high concentrations, if lead dust enters the respiratory tract, it will cause poisoning to the human body. Lead dust appears in the air in high concentrations when equipment using leaded fuel is in operation.

The method of monitoring air quality assessment parameters is carried out in accordance with regulations of the Ministry of Natural Resources and Environment on technical process of air environment monitoring and other international standards.

Currently, there are two commonly used methods to determine the concentration of pollutants in the air:

- A method of directly measuring parameters by automatic monitoring equipment (fixed/mobile/handheld) and displaying direct and continuous results in real time.

This method implemented

defining parameters: TSP, PM<sub>10</sub>, PM<sub>2.5</sub>, CO, SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub> ... This method It is highly appreciated and tends to be widely used in many countries around the world because it is possible to continuously monitor the ambient air quality of the monitoring area over time, detect changes in time. Abnormalities of substances existing in the air. Currently, in Vietnam, this method is mainly implemented in some big cities and provinces.

Concentrations of some substances in the air environment are determined as 1-hour average (which is the average value of measured values over a one-hour period) for SO<sub>2</sub>, CO, NO<sub>2</sub>, O<sub>3</sub> and TSP; 8-hour average (which is the average value of measured values over a continuous 8-hour period) for CO and O<sub>3</sub>; 24-hour average (which is the average value of measured values over a continuous 24-hour period (one day and night) for the TSP parameter, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, Pb; year mean (which is the mean of measured values over a one-year period) for TSP parameters, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and Pb.

- Method of taking field samples and bringing them to the laboratory for analysis and results. This is the traditional method, which has been used for many years in Vietnam; has a large number of monitoring points covering many localities; is the main source of data for assessing air quality. However, because this method can only determine the concentration of toxic substances in the air in a

certain period of time (depending on the number of monitoring times in the year), it is not possible to detect abnormal changes in the air in a timely manner. air quality.

According to this method, the concentration of some substances in the ambient air is determined as the average data of the year's observations of each parameter at the monitoring point.

## ***2.b. Unit of measure***

mg/m<sup>3</sup>

## ***2.c. Classifications***

The list of administrative units in Vietnam issued together with the Prime Minister's Decision No. 124/2004/QĐ-TTg dated July 8, 2004 and the changes updated by the General Statistics Office to date December 31, 2019)

## ***3.a. Data sources***

- Statistical reporting mode issued by the Ministry of Natural Resources and Environment;
- Monitoring data at monitoring stations of ministries, branches and localities.

## ***3.b. Data collection method***

Table 0401.1/BTNMT, statistical reporting mode issued by the Ministry of Natural Resources and Environment

More information at the link: <http://dwrn.gov.vn/uploads/laws/file/2017/2018/20-2018-tt-btnmt-quy-dinh-che-do-bao-cau-thong-ke-nganh-tnmt.pdf>

## ***3.d. Data release calendar***

Year.

## ***3.e. Data providers***

Ministry of Natural Resources and Environment

## ***3.f. Data compilers***

Ministry of Natural Resources and Environment

## ***4.a. Rationale***

Indicator reflects the level of air pollution causing adverse effects on human health; in case if the toxic content exceeds the allowable level. In addition, the indicator is used to serve the development of policies and measures to control air pollution.

## ***5. Data availability and disaggregation***

- Annual (not completely complete) PM2.5 concentration data from 2013-2018 according to station/monitoring point
- TSP concentration data are available annually from 2016-2018 by station/monitoring point

(Published source: 2020 national report on 5-year progress towards implementation of sustainable development goals. Data from the Ministry of Natural Resources and Environment)

## ***6. Comparability/deviation from international standards***

This indicator corresponds to the global SDG target “ **11.6.2:** Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)”.

## ***7. References and Documentation***

- Circular No. 03/2019/TT-BKHDT dated January 22, 2019 stipulating the set of statistical indicators for sustainable development of Vietnam;
- Circular No. 20/2018/TT-BTNMT dated November 8, 2018 stipulating the reporting regime for statistics of the Natural Resources and Environment sector
- <http://dwrn.gov.vn/uploads/laws/file/2017/2018/20-2018-tt-btnmt-quy-dinh-che-do-bao-cau-thong-ke-nganh-tnmt.pdf>
- <https://unstats.un.org/sdgs/metadata/>