

# NATIONAL TECHNICAL REGULATION ON INDUSTRIAL EMISSIONS: An important instrument in the Environmental Policy System

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## 1. INTRODUCTION

In recent years, air pollution in Vietnam has tended to increase and become increasingly complex, particularly in major urban areas such as Ha Noi, Ho Chi Minh City, and key industrial zones. The Air Quality Index (AQI) has, at times, exceeded permissible thresholds, while concentrations of fine particulate matter (PM<sub>2.5</sub>, PM<sub>10</sub>) frequently remain higher than the regulated limits, posing serious threats to public health, quality of life, and ecosystems. In this context, controlling emission sources - particularly industrial emissions, one of the main sources of pollution - has become an urgent task of decisive significance for air environment protection.

The National Technical Regulation (QCVN) on industrial emissions is an important instrument within the environmental policy system, stipulating limit values for pollutants in order to safeguard air quality. However, most current QCVNs on emissions were issued more than a decade ago, with approaches, limit values, and lists of parameters that are no longer suitable for the current pollution situation or new technological levels. This context requires a review, adjustment, integration, and modernization of the regulatory system to meet pollution management requirements in an effective, scientific, and internationally aligned manner.

This article aims to analyze the necessity and the key innovations in the process of revising the National Technical Regulation on industrial emissions. It clarifies the scientific



*The control of industrial emissions is an urgent and decisive requirement for air environment protection*

basis, international experience, and policy approaches being applied in Vietnam, while also pointing out several challenges and making recommendations to enhance the effectiveness and feasibility of implementing the new QCVN in practice in the coming period.

## 2. CURRENT STATUS OF AIR POLLUTION AND INDUSTRIAL EMISSION MANAGEMENT IN VIETNAM

Air pollution in Vietnam has become a major concern in environmental management, with increasingly evident manifestations in large cities and concentrated industrial production areas. Between 2016 and 2020, PM<sub>2.5</sub> and PM<sub>10</sub> concentrations in Ha Noi and Ho Chi Minh City frequently exceeded permissible limits set in QCVN 05:2013/BTNMT, at times reaching 1.5 - 2.2 times higher. Air quality deteriorated significantly during the winter and dry months, when unfavorable meteorological conditions combined with high emission density from transport, industry, construction, and open burning.

Major sources of pollution include: industrial zones (more than 290 currently operating), industrial clusters, traditional craft villages (over 4,500 villages, many facilities still lacking emission treatment infrastructure as required), thousands of boiler and incinerator facilities, along with the rapid development of construction, mining, and transport sectors (over 4 million cars and tens of millions of motorbikes). Waste burning, agricultural residue burning, and the use of honeycomb coal stoves in some localities are also significant contributors to increased particulate matter and pollutants such as CO, SO<sub>2</sub>, and NO<sub>2</sub>.



Although many national technical regulations on industrial emissions have been issued (including QCVN 19:2009/BTNMT, QCVN 20:2009/BTNMT, and several sector-specific QCVNs), most of these documents are outdated and have not been adjusted in time to respond to environmental changes and advances in production and treatment technologies. Fragmentation, lack of synchronization, and overlaps among existing QCVNs create difficulties in practical application, especially for enterprises with diverse business activities. In particular, the linkage between emission standards and ambient environmental quality objectives has not been fully established in the previous QCVN development process. This has resulted in many areas exceeding their capacity to absorb pollutants in the exhaust air, yet lack sufficient legal instruments to strictly control emissions based on environmental zoning - an important requirement outlined in the Law on Environmental Protection 2020.

Thus, improving the regulatory system on industrial emissions is not merely a technical step but a crucial condition to strengthen management effectiveness, prevent pollution at its source, and promote the adoption of clean technologies in production and business activities in Vietnam.

### 3. INTERNATIONAL EXPERIENCE AND NEW APPROACHES

International experience shows that effective emission standards must be based on the goals of protecting human living environment and ecosystems, while also aligning with technological reality and enforcement capacity. Most developed countries such as South Korea, Japan, the United States, and the European Union (EU) have adopted modern approaches to ensure effective control of air pollution while promoting clean technology transformation in industry.

**\*Ambient air quality objectives approach (ambient-based).** These countries determine emission limits based on protecting ambient air quality. This requires long-term environmental monitoring systems and health - ecological risk assessments as the basis for establishing permissible pollution thresholds. This forms the foundation for “upstream” emission standards that protect ambient air quality before defining acceptable emission levels.

**\*Technology-based approach.** In the United States and EU, emission limits are often set based on the treatment capacity of the best available techniques (BAT). BAT lists are updated periodically, making transparent the costs and environmental effectiveness

of technologies, thereby enabling businesses and regulators to select feasible, effective, and fair emission thresholds. Linking emission standards to technological capacity serves as a powerful instrument to foster technological innovation in production.

**\*Strengthening the role of independent technical bodies.** In the EU, South Korea, and Japan, the process of developing and revising emission standards is often carried out by specialized research institutes - independent of administrative agencies. This ensures scientific rigor, transparency, and minimizes conflicts of interest in environmental policy-making.

**\*Differentiated standards by region and production type.** Some countries such as Japan and South Korea allow local authorities to set stricter standards than national ones, depending on the environmental carrying capacity. At the same time, each production type is required to control only a specific group of characteristic parameters, instead of applying a universal list as is the case in some current QCVNs in Vietnam.

Drawing from these advanced models, the process of revising QCVNs in Vietnam has applied two approaches simultaneously: (1) top-down - establishing air quality management objectives by region; and (2) bottom-up - based on the practical capacity of industries and actual monitoring results. In addition, the draft QCVN has drawn extensively on South Korea’s experience - a country with many similarities in industrial development and enforcement capacity - as well as the EU’s regulations on BAT and environmental zoning. These approaches not only ensure policy feasibility and effectiveness but also pave the way for Vietnam’s deeper integration with national environmental standards in the region and globally, in the context of climate change and increasingly urgent sustainable development demands.

### 4. KEY INNOVATIONS OF THE NATIONAL TECHNICAL REGULATION ON INDUSTRIAL EMISSIONS

On December 30<sup>th</sup>, 2024, the Ministry of Natural Resources and Environment (now the Ministry of Agriculture and Environment) issued Circular No. 45/2024/TT-BTNMT on the national technical regulation on industrial emissions, QCVN 19:2024/BTNMT, effective from July 1<sup>st</sup>, 2025. The National Technical Regulation on Industrial Emissions (QCVN 19:2024/BTNMT) was promulgated with a spirit of comprehensive reform, ensuring consistency, modernization, feasibility, and alignment with the orientations of the 2020 Law on Environmental Protection. QCVN 19:2024/BTNMT introduces many

notable innovations, representing a significant advancement in thinking and tools for industrial emissions management in Vietnam.

*Consolidation and simplification of the regulatory system:* QCVN 19:2024/BTNMT replaces seven existing regulations on industrial emissions (such as QCVN 19:2009/BTNMT, QCVN 20:2009/BTNMT, QCVN 21–23...) and partially revises provisions on emissions in other five regulations, merging them into a single standard applicable to all facilities that discharge industrial emissions. This unification helps reduce duplication, eliminate contradictions, enhance coherence, and facilitate practical application in management.

*Environmental zoning-based management approach:* Unlike the previous system that applied relatively complex Kp and Kv coefficients, QCVN 19:2024/BTNMT specifies emission limit values according to three environmental zones: Zone A (strict protection), Zone B (restricted emissions), and Zone C (other areas). This approach directly links discharge standards with the environmental carrying capacity of each specific area, while closely following the environmental zoning orientation in the 2020 Law on Environmental Protection and Decree No. 08/2022/ND-CP.

*Review and optimization of control parameters:* The total number of emission parameters has been reviewed and reduced to 66 characteristic indicators, including 54 gaseous pollutants and 12 particulate pollutants. Compared to the old system of 119 parameters (many of which were not suitable for specific industries), QCVN 19:2024/BTNMT classifies parameters according to the type of emission source, requiring monitoring only of those characteristic of each industrial sector, avoiding unnecessary burdens and impractical requirements for enterprises.

*Tightening emission limits in line with new technological capacities:* QCVN 19:2024/BTNMT adjusts the permissible limits of emission parameters to be stricter by 20 -30%, especially for SO<sub>2</sub>, NO<sub>x</sub>, CO, and particulate matter (PM). For particulates in particular, the new limits are two to three times stricter than existing standards. The adjustment is based on current technological capabilities, monitoring results from more than 300 facilities, and experiences from countries such as South Korea and the EU, where stringent emission standards have long been applied.



*Establishments with high exhaust gas flow rates are required to conduct automatic and continuous monitoring of dust and gaseous emissions*

*Addition and clarification of technical terms and definitions:* QCVN 19:2024/BTNMT updates and standardizes concepts such as “industrial emissions,” “dust,” “gaseous/particulate matter,” “emission equipment,” “emission zone,” and “reference oxygen content,” thereby increasing transparency and consistency in application. The standardization of terms also improves the capacity for inspection, supervision, and enforcement at different levels.

*Linking technical requirements with measurement methods:* All 66 parameters are accompanied by clearly defined methods of determination, limiting outdated and unstandardized approaches. QCVN 19:2024/BTNMT emphasizes referencing current international standards, thereby improving the reliability of measurement results and reducing disputes in emission verification between enterprises and regulatory authorities.

Thus, the innovations in QCVN 19:2024/BTNMT on industrial emissions reflect a shift from purely administrative management toward science- and risk-based management. At the same time, they create a legal framework to encourage enterprises to adopt cleaner technologies, reduce emissions, and strengthen transparency in air quality protection.

## 5. CHALLENGES AND RECOMMENDATIONS

The revision of the National Technical Regulation on Industrial Emissions marks an important step in improving the legal framework for air pollution control in Vietnam. However, implementation of the new QCVN will inevitably face challenges in terms of technology, institutions, and capacity. Identifying these difficulties is essential for proposing feasible solutions to ensure both effectiveness and consensus in application.

*First*, stricter emission limits mean higher requirements for treatment technologies, while many facilities - especially small and medium-sized enterprises still rely on outdated



equipment and lack the capacity to comply. Financial constraints and limited access to clean technologies pose major obstacles in their compliance journey.

*Second*, emission monitoring, verification, and supervision systems in many localities remain fragmented, with staff capacity and equipment not yet meeting the new technical requirements. The application of environmental zoning (A, B, C zones) in emission control also raises higher demands on environmental planning and intersectoral coordination.

*Third*, businesses still express concerns about transparency in selecting characteristic parameters for monitoring and the risk of arbitrary application of technical requirements inconsistent with production specifics, if detailed and consistent guidance from central authorities is lacking.

*Fourth*, although QCVN 19:2024/BTNMT has introduced many innovations, the adoption of Best Available Techniques (BAT) is still at an early stage, requiring the establishment of mechanisms for evaluation, updating, and clearer guidance to ensure enterprises have an appropriate transition pathway.

Based on the above challenges, several recommendations are proposed to improve the effective implementation of QCVN 19:2024/BTNMT as follows:

- Strengthen technical and financial support, especially through environmental credit incentives, assistance for green technology innovation, and programs for BAT transfer to small and medium-sized enterprises.

- Develop independent monitoring and verification systems, invest in capacity-building for provincial environmental monitoring centers, and issue detailed, consistent technical guidelines for parameter selection, analysis methods, and zoning application.

- Establish consultation and intersectoral coordination mechanisms among environmental, industry, construction, and science-technology agencies to ensure coherence from planning to licensing, monitoring, and enforcement.

- Regularly review and update QCVN in line with actual environmental changes, technological progress, and international experiences, while aligning with Vietnam's environmental and climate commitments in the context of global integration.

## 6. CONCLUSION

Amid increasing air pollution and pressing demands for sustainable development, revising the National Technical Regulation on Industrial Emissions is a strategic move to enhance source-based pollution control, foster technological innovation, and improve

the institutional framework for air quality management in Vietnam. QCVN 19:2024/BTNMT introduces significant reforms from unifying standards, adopting environmental zoning, identifying industry-specific parameters, to tightening emission limits in line with current technological capabilities. These changes not only enhance regulatory effectiveness but also motivate enterprises to invest in cleaner technologies and integrate more deeply with advanced environmental management practices worldwide.

It can be said that QCVN 19:2024/BTNMT is not merely a technical instrument but also a “policy safeguard” for air quality protection, ensuring the constitutional right to live in a healthy environment as stipulated in Article 43 of the 2013 Constitution and the 2020 Law on Environmental Protection. It also serves as a foundation for Vietnam to gradually align with international environmental standards, advancing toward green development, a circular economy, and long-term carbon neutrality ■

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