



# 100/100 POLLUTION SCORE: WHY WASTE-TO-ENERGY INCINERATION PLANTS DON'T BELONG IN THE “BLUE” CATEGORY

A Case Study on the pollution index of the four WTE incineration Plants in Delhi and why the “blue” classification of WTEs is wrong.

# **100/100 POLLUTION SCORE:** **WHY WASTE-TO-ENERGY INCINERATION PLANTS** **DON'T BELONG IN THE “BLUE” CATEGORY**

**Surbhi Shukla**





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**Author: Surbhi Shukla**

Research Direction: Chythenyen Devika Kulasekaran

Cover Design and Layout: Anil Jalnila

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Website : [www.cenfa.org](http://www.cenfa.org) | Email : [info@cenfa.org](mailto:info@cenfa.org)

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## **EXECUTIVE SUMMARY**

This report challenges the **Central Pollution Control Board's (CPCB) 2025 reclassification of Waste-to-Energy (WTE) incineration plants** from the "Red" category to the newly created **"Blue" category which grants critical regulatory exemptions.**

Using evidence from CPCB's own documents, the report shows that WTEs produce 'hazardous' waste, which would disqualify them from making it to the 'blue' category.

Further, using CPCB's pollution index calculating formula, the report demonstrates that WTEs are in fact one of the highest polluting industries in India. Inventing an industry classification ('blue category') delinked from its pollution footprint to exempt it from regulatory safeguards, has disastrous consequences for the environment and public health.

The **Blue category**, introduced in 2025, is a specialized regulatory designation for "Essential Environmental Services" that manage domestic waste, prioritizing their social utility over their actual environmental impact. In practical terms, it exempts WTEs, which are a highly polluting industry, from the regulatory safeguards attached to the standard 0–100 **Pollution Index (PI)** scoring system, allowing them to bypass the strict oversight typically required for high-pollution industries.

By applying the CPCB's **documentation for** four major WTE facilities in Delhi, this study demonstrates that WTE plants transform municipal trash into toxic air emissions, contaminated wastewater, and hazardous ash.

All four Delhi WTE plants—Okhla, Ghazipur, Bawana, and Tehkhand—score a **cumulative PI of 100/100**. This means that WTEs are more polluting than coal fired thermal power plants, petrochemical industries and even open case mining.

Furthermore, CPCB has given a cumulative PI score of 97.6 out of 100 but our analysis, using their data, shows that the cumulative PI for WTEs is 100 out of 100. By documenting the score as 97.6 instead of 100, the CPCB avoids admitting that WTE plants have reached the absolute maximum "ceiling" of pollution potential.

CPCB's new rules state the Blue category is for services that **do not generate hazardous waste**; yet, WTEs generate thousands of tons of toxic ash annually. The four plants in Delhi process approximately **7,250 tonnes per day (TPD)** of mixed waste, providing a rigorous dataset for this assessment. Documented violations include toxic air emissions, hazardous solid waste and water contaminants.

The classification into 'blue category' represents a "regulatory blind spot" created through a non-transparent process dominated by industry feedback.

Blue category plants are permitted "**self-assessment**" of their PI scores and receive extended **Consent to Operate (CTO)** periods (7 years), reducing critical oversight.

The classification of WTE plants as "Blue" is scientifically indefensible and inconsistent with the **precautionary principle**. To protect public health and maintain the integrity of India's environmental governance, WTE incineration must be returned to the **Red category**, ensuring the stringent monitoring and frequent inspections required for the nation's most polluting industries.



# INTRODUCTION

Delhi's headlines for a long time have been its abysmal air quality index. The basic act of breathing carries profound long-term health risks, reducing the average lifespan of a Delhiite by about 12 years. While public attention routinely fixates on seasonal agricultural stubble burning or vehicular pollution, a permanent yet important contributor to Delhi's pollution is the burning of about 7,250 tons of unsegregated Municipal Solid Waste daily in the city's four Waste To Energy (WTE) Incinerators.

Waste-to-energy incineration is the process in which Municipal Solid Waste (MSW) is burnt in a furnace to produce heat. The heat is used to produce steam that drives a generator to produce electricity. But apart from that it also produces bottom ash and fly ash which are hazardous in nature and need a scientific landfill to dispose of.

These WTE incinerators pose considerable risk not only to the health and environment of neighboring communities but also to the general population by reducing the Ambient Air Quality. They pollute air, water, and soil by releasing SO<sub>x</sub>, NO<sub>x</sub>, PM 2.5, PM 10, HCL, heavy metals, dioxins, furans, etc. Positioned directly inside dense municipal spaces—these facilities continuously externalize their toxic operating costs onto millions of vulnerable citizens, turning local neighborhoods into sacrifice zones.

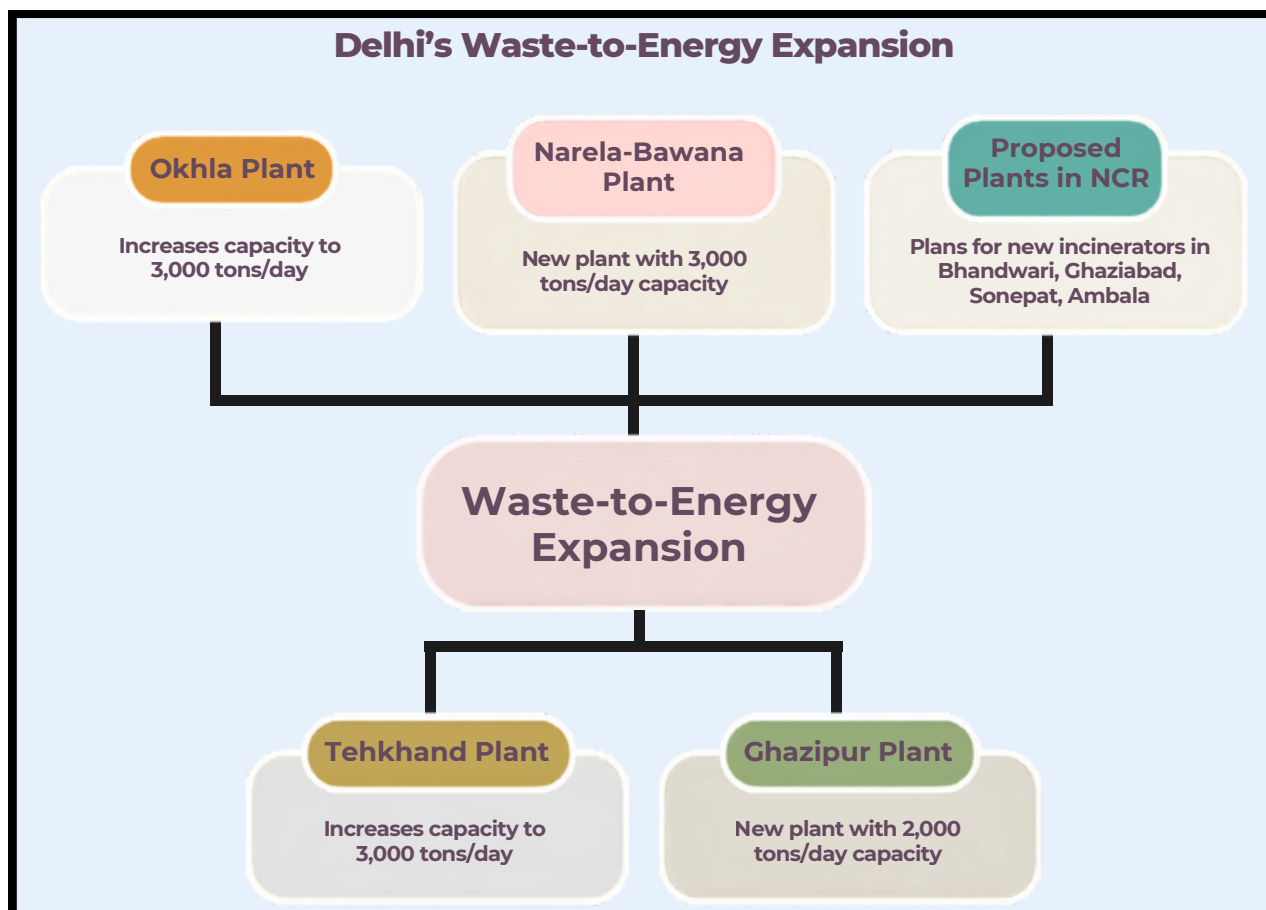
The 5-year investigative reporting by The New York Times, has cast a fierce global spotlight on the operational failures and toxic realities of Delhi's incinerators. The report, which collected over 150 samples found incinerator ash with cadmium registering 19 times higher, manganese 11 times higher, arsenic 10 times higher, and lead 4 times higher than safe thresholds, threatening local families with irreversible bone, kidney, cardiovascular, and neurological diseases. Overall, the report found that the Okhla WTE plant impacted the health of more than 1 million people.

However, against all logical reasoning, plans are afoot to burn an additional 7,000 tons of mixed garbage/day by 2027 in Delhi by increasing the incineration capacity of the Okhla and Tehkhand plant to 3,000 tons/day each and two new plants in Narela-Bawana and Ghazipur to burn 3,000 and 2,000 tons/day of MSW respectively. Overall, Delhi plans to burn about 14,250 tons of garbage per day by 2027 in its four incinerators. Apart from this, there are plans to build new WTE incinerators in Bhandwari, Ghaziabad, Sonapat, Ambala etc in the NCR region.

The critical urgency of this study is further amplified because Delhi is not an isolated administrative failure; across India, hundreds of municipal corporations are actively planning, funding, or constructing WTE incineration plants that burn unsegregated MSW.







Historically categorized as the highly polluting "Red" category industries due to their severe environmental impacts, WTE plants were abruptly shifted by the CPCB into a newly invented, incentivised classification: the "Blue" category in 2025. This reclassification represents an unprecedented, systematic rollback of environmental governance safeguards. This "Blue" designation is not merely scientifically indefensible; it is fundamentally illegal under the CPCB's own statutory criteria. The official CPCB guidelines explicitly state that the Blue category is strictly reserved for environmental services that do not generate hazardous waste. Yet, using primary evidence from the joint CPCB-DPCC monitoring reports reveal that WTE plants are massive producers of hazardous waste laced with heavy metals like cadmium, lead, and mercury, alongside lethal Persistent Organic Pollutants (POPs) like dioxins and furans disqualifying them from the Blue categorisation.

By unmasking the 100/100 pollution reality, this report demonstrates that the Blue classification is a profound policy failure that sacrifices public health, defies the precautionary principle, and must be immediately reversed to protect the integrity of India's environmental architecture.





## **RESEARCH OBJECTIVES**

This study was driven by three key objectives:

- **To examine whether the 'Blue' category industry classification applies to WTE plants.**
- **To critically examine whether the CPCB assigned pollution index to WTE plants follows CPCB's own PI Index calculation methodology. To assess the legitimacy of classifying WTE incineration plants under the "Blue" category** according to the CPCB's 2025 revised framework requirements, in light of extreme levels of pollution generated by them.





## **NOTE ON METHODOLOGY**

This study is grounded entirely in official records and technical documentation issued by the Central Pollution Control Board (CPCB), Delhi Pollution Control Committee (DPCC) and those filed before public authorities such as the and the National Green Tribunal (NGT) etc. The research was designed to answer two key questions: first, whether WTE incineration plants can legitimately be placed within the CPCB's "Blue" category under the stated criteria of "Essential Environmental Services"; and second, whether the pollution index assigned to these plants is consistent with the CPCB's own Pollution Index (PI) methodology. To address the first research question on the classification validity, the study examined whether WTE plants can fit the Blue category under CPCB's own criteria and the Excel PI tool.

To address the second objective on the Pollution Index score validity, the study applied CPCB's scoring method and source material extracting plant-specific evidence on air, water and the pollutant in incinerator ash from joint CPCB-DPCC monitoring reports. Finally, the data were interpreted, checked, and converted into a classification assessment through triangulation across official documents CPCB's thresholds and definitions and a precautionary reading of the evidence where official records already show hazardous waste or emissions exceedances. The study therefore represents a re-evaluation of WTE plants using the CPCB's methodology, data sources, thresholds, and definitions.

### **The CPCB Pollution Index (PI): Background & Definition**

The **Pollution Index (PI)** is a standardised numerical score developed by the CPCB to quantify the pollution potential of any industrial sector. It assesses the inherent pollution of an entire industry rather than the performance of an individual plant. Instead of grading how well a specific plant is managed, the CPCB assigns a fixed score to an entire industrial category based on its typical pollution potential. Consequently, this score serves as a "regulatory blueprint" that dictates the baseline rules for every unit in that sector, regardless of whether a particular facility is newer or cleaner than its peers. It is the measure on a scale of 0 to 100 that integrates three distinct forms of environmental impact: pollution of water bodies (through effluent discharge), pollution of the air (through emissions), and generation of hazardous solid waste.

A higher PI score signifies a greater degree of pollution load associated with that industrial sector. The PI framework serves multiple regulatory purposes: it determines the frequency of pollution control inspections, governs the conditions attached to Consent to Establish (CTE) and Consent to Operate (CTO) licences, informs siting decisions for new industrial units, and guides the levying of environmental compensation. A higher PI score will invite greater scrutiny. In essence, the PI score is the foundational instrument through which India's pollution control framework categorises and regulates industries.

However, even this framework has critical methodological flaws, including arbitrary weightage and the reclassification of highly polluting sectors. Weakened by poor enforcement and reliance on unreliable data, the PI framework fails to capture lived experiences, reflect real-time industrial impacts and improve critically polluted areas.

| Score      | Component                  | What it Measures                                                                                                    | Range |
|------------|----------------------------|---------------------------------------------------------------------------------------------------------------------|-------|
| <b>PIW</b> | Water Pollution Score      | BOD/COD levels, toxic water pollutants (heavy metals, solvents), volume of industrial effluent/wastewater generated | 0–100 |
| <b>PIA</b> | Air Pollution Score        | Toxic air emissions, fugitive/process emissions, fuel consumption scale and type                                    | 0–100 |
| <b>PIH</b> | Hazardous Waste Score      | Type and volume of hazardous/toxic solid waste generated annually (tonnes/year)                                     | 0–100 |
| <b>PI</b>  | Cumulative Pollution Index | Weighted composite of PIW + PIA + PIH (equal weightage to all three pollutant groups)                               | 0–100 |

The formula for computing the cumulative PI is:

$$\text{PI} = (\text{PIW} + \text{PIA} + \text{PIH}) / 3$$

[weighted average of equal components, each scored 0–100].

The Excel Tool for Assessment of Pollution Index and Category of Sector is publicly accessible at: [cpcb.nic.in/categorization-of-industrial-sectors/](http://cpcb.nic.in/categorization-of-industrial-sectors/).

The Pollution Index methodology was first formalised by the CPCB in its **2016 Revised Categorisation of Industries** (commonly called the "Concept Note"), issued under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974. The 2016 framework replaced earlier category lists with a transparent, score-based system and introduced four categories (Red, Orange, Green, White).

The methodology was most recently updated in **January 2025**, when CPCB published its *"Classification of Sectors into Red, Orange, Green, White and Blue Categories"* report. This 2025 document introduced a revised scoring system, revised PI thresholds for categories, and a new fifth category "Blue" for Essential Environmental Services. The revised thresholds under the 2025 methodology are: Red (PI ≥ 80), Orange (55 ≤ PI < 80), Green (25 ≤ PI < 55), and White (PI < 25).

CPCB has subsequently formalised these new rules through a direction dated 12 February 2025, under CP-18/1/2023-IPC-VI, making the revised system binding on all State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs).

# THE BLUE CATEGORY: A NEW AND CONTESTED CLASSIFICATION

## Introduction of the Blue Category

In January 2025, CPCB introduced a fundamentally new tier in its industry classification framework: the "Blue" category. Unlike the Red, Orange, Green, and White categories which are each pegged to a specific range of Pollution Index scores, the Blue category operates on a different logic entirely. It is not assigned based on a PI score range; instead, it is reserved for facilities designated as **"Essential Environmental Services" (EES)** for managing waste from domestic and household activities.

Industries in the Blue category include: municipal solid waste management facilities (including Waste-to-Energy plants), biomining of legacy waste projects, construction and demolition waste processing plants, compressed biogas (CBG) plants using MSW or agro-residue, and sewage treatment plants (STPs). CPCB has classified a total of **9 industrial sub-sectors** under Blue.

## What Does Blue Classification Mean in Practice?

The primary regulatory concession offered under the Blue category is an **extended Consent to Operate (CTO) validity**: Blue category facilities may receive CTO renewals

| Category | PI Range                                | Description                                                                                                                                                         | Examples                                                                                         |
|----------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| RED      | PI ≥ 80                                 | Highly polluting industries. Stringent monitoring, frequent inspections, continuous emission monitoring required.                                                   | Petroleum Refineries, Thermal Power Plants, Pharmaceutical Manufacturing                         |
| ORANGE   | 55 ≤ PI < 80                            | Moderately polluting. Regular consent management and periodic inspections.                                                                                          | Automobile Servicing and Repair, Food and Fruit Processing, Printing Presses                     |
| GREEN    | 25 ≤ PI < 55                            | Low pollution potential. Standard compliance obligations.                                                                                                           | Small Hotels and Resorts, Flour Mills, Bicycle Assembly Units                                    |
| WHITE    | PI < 25                                 | Practically non-polluting. Exempt from most consent requirements.                                                                                                   | Solar and wind Power Generation, IT and Software Development, Bio-fertilizers and Bio-pesticides |
| BLUE     | <b>Essential Environmental Services</b> | New 2025 category for domestic waste management services (STPs, MSW units, WTE plants). Extended CTO validity of 5+2 years. PI score determined by self-assessment. | Waste-to-Energy (WTE) Plants (Incineration), Composting Units, Secured Landfills                 |



for a period of 5 years plus an additional 2-year extension, totalling 7 years compared to 5 years for other categories.

The official justification offered by CPCB is that WTE plants perform a social service by diverting waste away from overburdened landfills and therefore merit recognition as environmental service providers rather than being regulated solely as polluters. However, the blue categorisation masks the most significant regulatory rollback: the CPCB is currently mooted the removal of prior Environmental Clearance (EC) requirements for Blue category industries, which would eliminate the mandatory Environmental Impact Assessment (EIA) process and its associated public hearings.

While WTEs and other toxic facilities such as landfills are currently regulated under the EIA Notification 2006 as common waste management facilities, moving them to the Blue category effectively bypasses this critical layer of independent expert oversight and community consultation, replacing rigorous pre-construction scrutiny with a simplified administrative process.

### **'Blue' Classification Despite Hazardous Waste Production**

The directions issued by the CPCB say that "The Essential Environmental Services (EES) which do not generate Hazardous Waste and which otherwise have large littering potential can be categorised as Blue Category Projects." However, CPCB's reports have found WTEs to generate thousands of tons of hazardous waste per annum. Hence, WTEs cannot be classified as "blue category" industries.

CPCB reports highlight that none of the 21 waste-to-energy (WTE) facilities operating across India are compliant with all monitored emission parameters—most notably dioxins, furans, and heavy metals. While common pollutants like dust (PM) are easier to filter, dioxins and furans are highly complex organic chemicals that form when plastic and mixed waste are burned at inconsistent temperatures. These are known as "Persistent Organic Pollutants" (POPs), meaning they do not break down in the environment and instead build up in the human body over time, primarily in fat tissues. Even at microscopic levels, long-term exposure is linked to severe health issues, including cancer, immune system damage, and reproductive problems.

The failure to control heavy metals (such as lead, mercury, and cadmium) is equally critical. These metals are released from burning items like batteries, electronics, and paints found in unsegregated city waste. Unlike organic matter, heavy metals are indestructible; if they aren't captured by high-tech filters, they escape through the chimney or remain in the toxic "fly ash." This non-compliance indicates that the existing pollution control technology in these 21 plants is either insufficient or improperly operated, posing a direct toxicological risk to the air, soil, and food chain in surrounding areas.



Furthermore, CPCB has given a cumulative PI score of 97.6 out of 100 but our analysis using their data shows that the cumulative PI for WTEs is 100 out of 100. While the 2.4 point difference may seem insignificant at first glance, it is hiding the extreme toxicity of WTEs. By documenting the score as 97.6 instead of 100, the CPCB avoids admitting that WTE plants have reached the absolute maximum "ceiling" of pollution potential.

A score of 100/100 implies a "perfect storm" of extreme air emissions, heavy water discharge, and hazardous waste—making it impossible to justify as an "environmental service". This raises the critical question on why these facilities have been elevated to the Blue status? The transition to the Blue category reflects significant "regulatory capture" by the industry lobby, which dominated over 75% of the CPCB's consultation process while environmental groups were largely excluded. By rebranding high-pollution incineration as an "Essential Environmental Service," the industry lobby successfully secured a regulatory shield that protects the most polluting industry in India from strict oversight, high compliance costs, and public scrutiny associated with the Red category. This shift effectively prioritizes the protection of an industry over the scientific reality of the plants' extreme toxic output.

### Critical Concerns with the Blue Classification

- The Blue category does not assign a PI range. Facilities in Blue are not bound by the 0–100 scoring system that governs every other category. This creates a regulatory blind spot for facilities with documented PI scores of 97.6 (according to the CPCB) or 100 (according to our analysis).
- The 2016 framework and all prior CPCB guidance unambiguously placed WTE plants under the Red category because of severe pollution created by these facilities. The shift to Blue was not preceded by any published evidence of emission reduction or improved environmental performance.
- The first "Draft Report on Classification of Sectors into Red, Orange, Green, and White Categories" which was published in July 2023 and invited comments till September 2023 did not have the blue classification. The consultation process received 161 representations of which 76% came from the industry and only 1% came from civil society organisations and none from impacted communities. Industry associations dominated the feedback.
- The Blue category was introduced rather surreptitiously via an addendum on 11.07.2024 and the window period for giving comments was only 30 days! only 9 comments were received during the given window and the comments/representations have also not been made public.
- Blue category plants, in contrast to those put in red and orange categories, are required to "self-assess" their PI scores introducing a structural conflict of interest into the very mechanism designed to protect the public from pollution.



# **CASE STUDY ON THE POLLUTION INDEX OF THE FOUR WTE PLANTS IN DELHI**

This study focuses specifically on the four operational Waste-to-Energy plants in Delhi located at Okhla, Ghazipur, Narela-Bawana, and Tehkhand for several interrelated reasons that make Delhi the most analytically rigorous and publicly significant site for this assessment.

First, Delhi's WTE plants are among the most extensively documented incineration facilities in the country. Unlike most WTE plants in other Indian cities, the Delhi plants have been subject to repeated judicial scrutiny before both the National Green Tribunal (NGT) and the Supreme Court of India resulting in a substantial volume of CPCB inspection reports, joint CPCB-DPCC monitoring reports, and regulatory submissions that are available in the public domain. This body of primary data including plant-specific measurements of BOD, COD, dioxin levels, heavy metal concentrations in ash, and leachate quality makes it possible to construct a genuinely evidence-based Pollution Index assessment grounded in actual measured parameters rather than assumed or generic values.

Second, Delhi operates all four plants simultaneously, providing a comparative dataset across plants of different scales (1,300 TPD to 2,400 TPD), different operators, different locations, and different ages of commissioning. This diversity within a single city allows for cross-plant comparison while controlling for the broader regulatory environment. The CPCB and Delhi Pollution Control Committee (DPCC) have conducted joint inspections across all four plants simultaneously, generating directly comparable monitoring data.

Third, Delhi's WTE plants were among the first to be commissioned in India and have accumulated longer operating histories, generating richer longitudinal data on compliance trends, emission violations, and operational challenges. The Okhla plant, India's first WTE facility commissioned in 2012, recorded dioxin levels 900% above prescribed limits during CPCB inspection, the Bawana plant recorded 500% above the prescribed limits and Ghazipur plant recorded 270% above the CPCB limits. These reports have been subjects of documented regulatory non-compliance whose records are accessible through NGT case files.

Fourth, Delhi as a city is already critically air-polluted, recording among the worst ambient air quality globally. The presence of four large-scale combustion facilities within the urban fabric of this city collectively burning over 7,250 tonnes of mixed municipal solid waste daily makes the accurate classification of these plants a matter of direct public health importance for millions of residents. Community groups near Okhla, Ghazipur, Bawana, and Tehkhand have documented respiratory health impacts, and the proximity of these plants to residential colonies (in some cases as close as 35-40 metres from housing) means the stakes of regulatory misclassification are not merely technical but human.



## WTE Plant Details

The table below summarises the key characteristics of the four WTE plants studied. All capacity and power generation data are drawn from a Lok Sabha response dated December 2024.

| Plant Name          | Location                        | Operator                                                         | Waste Capacity in tons per day | Power Generated |
|---------------------|---------------------------------|------------------------------------------------------------------|--------------------------------|-----------------|
| Okhla WTE           | Sukhdev Vihar, South-East Delhi | Timarpur-Okhla Waste Management Co. Ltd. (TOWMCL / Jindal Urban) | ~1,950–2,000                   | 21-23 MW        |
| Ghazipur WTE        | Ghazipur, East Delhi            | Ever Enviro Resource                                             | ~1,300                         | 12 MW           |
| Narela - Bawana WTE | Narela Industrial Area,         | Delhi MSW Solutions Ltd.                                         | ~2,400                         | 24 MW           |
| Tehkhand WTE        | Tehkhand, South Delhi           | South Delhi Municipal                                            | ~2,000                         | 20 MW           |

Combined, these four plants process approximately **7,250 TPD of mixed municipal solid waste** and generate approximately **77 MW of electricity**. Each is operated under a public-private partnership model and receives tipping fees from municipal bodies as well as guaranteed power purchase agreements from Delhi's electricity distribution companies.

## WTE pollution pathways

The diagram below illustrates the three pollution output streams from a WTE incineration plant each corresponding to one of the three PI components and their mapping to the final cumulative PI score.

| WASTE-TO-ENERGY INCINERATION PROCESS — POLLUTION PATHWAYS                                               |                                                                                          |                                                                                                                 |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| STACK EMISSIONS (AIR)<br>PM, HCl, HF, SO <sub>2</sub> , NO <sub>x</sub> , dioxins, furans, heavy metals | WASTEWATER (WATER)<br>Leachate, ash quenching water, APC system effluent, scrubber water | STREAMS<br>FLY ASH + BOTTOM ASH (SOLID)<br>20–30% of waste input — heavy metals, secured TSDF disposal mandated |

## Application to PI methodology for pollution assessment

In this study, the PI methodology was applied to the four Delhi WTE plants using pollution characteristics that are documented in CPCB's technical reports and regulatory submissions, not operator-provided data or promotional materials. The analysis relies strictly on: (a) CPCB's **NGT submissions** in OA No. 536 of 2024; (b) CPCB's technical documents on WTE plants; and (c) the joint CPCB-DPCC monitoring reports filed before the Supreme Court in 2025. The summary table below captures the key pollutant parameters documented per plant:

| Plant                             | Water Pollution (PIW)                                                                              | Air Pollution (PIA)                                                                                                     | Hazardous Waste (PIH)                                                                              |
|-----------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Okhla WTE (Sukhdev Vihar)</b>  | Exceeds BOD norms; scrubber effluent with dissolved organics contributing to COD                   | Dioxins & furans recorded; PM emissions; acid gas (HCl, HF) from chlorinated plastics                                   | ~390-400 TPD fly ash + bottom ash; cadmium, lead detected; secured TSDF disposal required          |
| <b>Ghazipur WTE (East Delhi)</b>  | Elevated dissolved solids and chlorides in treated effluent; leachate documented                   | Dioxins & furans recorded at 170% above prescribed limits (per CPCB inspection); OCEMS data mismatch flagged            | ~260-390 TPD ash; unburnt plastics in bottom ash documented; ash quenching wastewater generated    |
| <b>Bawana WTE (Narela-Bawana)</b> | Treated effluent exceeds BOD norms; groundwater exceedances for TDS, hardness, sulphates, nitrates | Dioxin, furan and cadmium+thallium levels exceed stack norms; fly ash exceedances for Cd, Mn, Pb, Cu                    | ~480-720 TPD ash; fly ash exceeds norms for cadmium, manganese, lead, copper; classified hazardous |
| <b>Tehkhand WTE (South Delhi)</b> | Treated effluent exceedances for chloride and phenolic compounds                                   | Stack emissions meeting most norms except for occasional heavy metal exceedances; fugitive emissions from waste storage | ~200-300 TPD ash; hazardous ash disposal required under SWM Rules 2016; TSDF mandated              |

### Okhla WTE Plant (Sukhdev Vihar, South-East Delhi)

- Operator: Timarpur-Okhla Waste Management Company Limited (TOWMCL), a Jindal Urban Infrastructure group entity
- Capacity: ~1,950-2,000 TPD; Power: 21-23 MW
- Water (PIW): CPCB-mandated leachate and scrubber effluent monitoring has documented BOD/COD contributions. Ash quenching wastewater and APC system effluent are generated. The plant is located adjacent to the Okhla dumpsite, with leachate seepage pathways identified in monitoring reports.
- Air (PIA): Okhla's stack has recorded PM2.5 and dioxin/furan emissions above permissible limits in multiple CPCB inspections. At 1,950+ TPD, the plant is firmly in the highest fuel consumption bracket of the PI scoring system. Proximity to residential areas (as close as 35-40 m) amplifies community exposure.
- Hazardous Waste (PIH): At 20-30% ash generation rate, Okhla generates approximately 390-400 TPD of fly and bottom ash. CPCB mandates secured TSDF disposal; compliance with this requirement has been disputed in NGT proceedings.



### Ghazipur WTE Plant (East Delhi)

- Operator: Ever Enviro Resource Management Pvt. Ltd. (formerly IL&FS Environmental Infrastructure & Services)
- Capacity: ~1,300 TPD; Power: 12 MW
- Water (PIW): CPCB monitoring reports flagged elevated levels of dissolved solids and chlorides in treated effluent. Leachate from the co-located Ghazipur dumpsite interacts with plant wastewater pathways. Groundwater exceedances for TDS, hardness, and sulphates have been flagged around the facility.
- Air (PIA): A CPCB inspection found dioxin and furan levels exceeding prescribed limits by **270%**. The OCEMS (Online Continuous Emissions Monitoring System) data at the plant was found to not match CPCB's independent readings, raising concerns about monitoring integrity.
- Hazardous Waste (PIH): At 1,300 TPD, approximately 260-390 TPD of ash is generated. Bottom ash inspection revealed unburnt plastics and organic material, indicating incomplete combustion, a condition that generates additional toxic residues. The plant has operated without valid Consent to Operate for extended periods.

### Bawana (Narela-Bawana) WTE Plant (North Delhi)

- Operator: Delhi MSW Solutions Ltd.
- Capacity: ~2,400 TPD; Power: 24 MW
- Water (PIW): Bawana's treated effluent was found to exceed BOD norms, the most direct water pollution trigger under PIW scoring. Groundwater sampling in the vicinity has flagged exceedances for TDS, hardness, sulphates, nitrates, and phenolic compounds.
- Air (PIA): The CPCB-DPCC joint report (2025) confirmed that dioxin, furan, and cadmium+thallium levels exceeded stack emission norms at Bawana, the only Delhi WTE plant where this was quantitatively documented in the most recent joint report. This is a direct PIW = maximum-score trigger under air pollution scoring.
- Hazardous Waste (PIH): Fly ash from Bawana was confirmed to exceed regulatory limits for cadmium, manganese, lead, and copper. At 2,400 TPD processing capacity, approximately 480-720 TPD of ash is generated. Cadmium and lead exceedances in fly ash classifying it as hazardous waste requiring secured TSDF disposal is a high PIH trigger. Iron exceeded groundwater limits at Bawana and Ghazipur.

### Tehkhand WTE Plant (South Delhi)

- Operator: South Delhi Municipal Corporation (MCD) / SDMC
- Capacity: ~2,000 TPD; Power: 20 MW
- Water (PIW): Tehkhand's treated effluent was found to exceed norms for both chloride and phenolic compound concentrations triggers for PIW scoring under W2 (toxic pollutants in effluent). Leachate generation and ash quenching wastewater are documented process outputs.
- Air (PIA): Stack emissions at Tehkhand largely met SPM norms in the 2025 joint report, with occasional heavy metal exceedances noted. Fugitive emissions from the waste.



## Pollution Index Outcome

When the CPCB PI framework is applied using the documented pollution characteristics above drawing on CPCB's data and regulatory submissions the cumulative Pollution Index for each plant falls at **PI = 100**, sitting at the top of the Red category threshold of  $PI \geq 80$  under the 2025 revised system (and even further above the 2016 threshold of  $PI \geq 60$ ).

| Plant        | PIW (Water) | PIA (Air) | PIH (Waste) | Analysed Cumulative PI | CPCB's official PI |
|--------------|-------------|-----------|-------------|------------------------|--------------------|
| Okhla WTE    | 95          | 100       | 95          | ~100                   | 97.6               |
| Ghazipur WTE | 95          | 100       | 95          | ~100                   | 97.6               |
| Bawana WTE   | 95          | 100       | 95          | ~100                   | 97.6               |
| Tehkhand WTE | 95          | 100       | 95          | ~100                   | 97.6               |

However, CPCB has wrongly assigned a cumulative PI of 97.6 with  $PIW = 45$ ,  $PIA = 95$ , and  $PIH = 60$ . This score exceeds the Red category threshold ( $PI \geq 80$ ) by over 17 points.



|                                                             | Water Pollutants Considered                                                                                      | Score | Max       |    |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------|-----------|----|
| W1: 1 - 5: BOD                                              | W1-2: $1000 \leq \text{BOD} < 5,000 \text{ mg/l}$                                                                | 30    | 30        | W1 |
| W1: 1 - 5: COD                                              | W1-2: $5000 \leq \text{COD} < 10,000 \text{ mg/l}$                                                               | 30    | 30        | W1 |
| W2:1                                                        | Chloramines; Total/Hexavalent Chromium - Cr; Copper                                                              | 30    | 30        | W2 |
| W2:2                                                        | Ammonical Nitrogen; Nitrate; Nitrate Nitrogen; Oil & Grease; Total Kjeldahl Nitrogen (TKN); pH, $<5.5$ or $>9$ ; | 25    | 30        | W2 |
| W2:3                                                        | solution rejects; Other similar operations;                                                                      | 20    | 30        | W2 |
| W2:4                                                        | Wastewater from Cooling Towers; Cooling-re-circulation processes; Other similar operations;                      | 15    | 30        | W2 |
| W3: 1 - 5: Industrial                                       | Wastewater $\geq 500 \text{ KLD}$                                                                                | 35    | 35        | W3 |
| W3: 6 - 10: Sewage                                          | $100 \text{ KLD} \leq \text{Sewage} < 500 \text{ KLD}$                                                           | 20    | 35        | W3 |
| <b>Water Pollutant Score: <math>PI(W) = W1+W2+W3</math></b> |                                                                                                                  |       | <b>95</b> |    |

| Air Pollutant Group                                       | Air Pollutants Considered                                                                                                                                                                                | Air Pollutant Group | Air Pollutants Considered | Air Pollutant Group |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------|---------------------|
| A1:1                                                      | Dioxins & Furans, Polycyclic Aromatic Hydrocarbons (PAHs), Cadmium-Cd, Thorium-Th, Mercury-Hg, Antimony-Sb, Arsenic-As, Lead-Pb, Cobalt-Co, Chromium-Cr, Copper-Cu, Manganese-Mn, Nickel-Ni, Vanadium-V, | 35                  | 35                        | A1                  |
| A1:2                                                      | H <sub>2</sub> S, HF, NH <sub>3</sub> , TOC, Chlorine, HCl, SO <sub>3</sub> , Total Fluoride,                                                                                                            | 30                  | 35                        | A1                  |
| A1:3                                                      | PM, CO <sub>2</sub> , CO, NO <sub>x</sub> , SO <sub>2</sub> ,                                                                                                                                            | 25                  | 35                        | A1                  |
| A1:4                                                      | Ethyl Benzene, Styrene, Toluene, Xylene, Aromatics, Propylene Glycol, Ethylene Glycol,                                                                                                                   | 20                  | 35                        | A1                  |
| A2:1                                                      | VOCs, etc. from the process,                                                                                                                                                                             | 30                  | 30                        | A2                  |
| A2:2                                                      | Fugitive emissions of Particulate Matter (PM), acid mist, VOCs, etc. due to Storage and Handling, etc                                                                                                    | 25                  | 30                        | A2                  |
| A2:3                                                      | binding gums, cements, adhesives, enamels, etc.,                                                                                                                                                         | 20                  | 30                        | A2                  |
| A3:1-3                                                    | Fuel consumption $\geq 24 \text{ TPD}$                                                                                                                                                                   | 35                  | 35                        | A3                  |
| A3:4-6                                                    | Fuel consumption $\geq 48 \text{ TPD}$                                                                                                                                                                   | 25                  | 35                        | A3                  |
| <b>Air Pollutant Score: <math>PI(A) = A1+A2+A3</math></b> |                                                                                                                                                                                                          |                     | <b>100</b>                |                     |

| Waste Pollutant Group                                           | Waste Pollutants Considered     | Score | Max       | Waste Pollutant Group |
|-----------------------------------------------------------------|---------------------------------|-------|-----------|-----------------------|
| H1:2                                                            | after stabilization (H1-2)      | 25    | 25        | H1                    |
| H2: 1 - 5                                                       | Hazardous Waste $\geq$ 5000 TPA | 70    | 70        | H2                    |
| <b>Waste Pollutant Score: <math>PI(H) = (H1+H2)</math> or B</b> |                                 |       | <b>95</b> |                       |

|                                |           |
|--------------------------------|-----------|
| Cumulative Pollution Index: PI | Inference |
|                                | 100       |
| Category of Sector:            | Red       |

*Figure: PI calculated for the WTEs in Delhi using CPCB's Excel Tool for Assessment of Pollution Index*

This table is a mathematical "scorecard" that calculates the Pollution Index (PI) for the WTE plants in Delhi. It breaks down the environmental impact into three main categories: Water, Air, and Hazardous Waste.



### 1. Water Pollutant Score (PIW = 95)

This section tracks what the plant discharges into water bodies.

- Organic Load: High scores (30/30) are given for BOD and COD, which measure how much oxygen the waste strips from water.
- Toxins: It scores 30 for heavy metals like Hexavalent Chromium and Copper, which are highly toxic.
- Volume: The plant gets a high score (35) because it generates a massive amount of industrial effluent (over 500 KLD).

### 2. Air Pollutant Score (PIA = 100)

This is the most critical section, where the plant hits the maximum possible score.

- The "Deadly" Group (A1:1): It receives a 35/35 for emitting Dioxins, Furans, and Mercury. These are "Persistent Organic Pollutants" that cause cancer and do not break down in nature.
- Acid Gases & Smog: High scores are given for Nitrogen Oxides (NOx) and Sulphur Dioxide (SO2), which cause respiratory issues and acid rain.
- Fuel Consumption: The plant burns massive amounts of fuel (over 48 TPD), pushing the score to the ceiling.

### 3. Waste Pollutant Score (PIH = 95)

This measures the solid "leftovers" or the ash that is produced after burning waste.

- Hazardous Quantity: The plant gets a near-perfect 70/70 for generating more than 5,000 tonnes per annum (TPA) of hazardous waste.
- Fly Ash: Even after stabilization, the leftover ash is considered highly toxic, contributing the remaining points.

### The Final Inference

- Cumulative PI: 100 The final calculation uses the formula

$$PI = (PIW + PIA + PIH) / 3$$

The CPCB's excel toolkit generates a cumulative PI score of 100, indicating the highest possible pollution potential.

- Category Red: Any score above 80 is "Red." At 100, this facility is categorized as the most environmentally hazardous type of industry in the country.

### Classification Discrepancy: Red Data, Blue Label

Despite the documented high PI score of 100 which unambiguously classifies WTE incineration at the topmost polluting industry of the Red category, CPCB's 2025 framework assigns WTE plants to the **"Blue" category**, ostensibly on the basis of their designation as "Essential Environmental Services." This classification rests on a policy judgment, not on a lower pollution score. The structural inconsistencies that follow from this classification are significant:

- Assigning WTE plants to Blue effectively removes them from the score-based tiering system that governs every other industry category, creating a regulatory double standard.

- The Blue category's "self-assessment" model for PI scoring introduces a structural conflict of interest: the very entities whose pollution potential is being measured are responsible for measuring it.
- Assigning PIW = 0 to any WTE plant would directly contradict CPCB's own published acknowledgement that WTE plants generate leachate, ash quenching wastewater, and APC system effluent.
- The CPCB's 2025 monitoring report to the NGT confirmed that dioxins, furans, and heavy metals were not being monitored at most of 21 WTE facilities nationally meaning the self-assessment data being used to justify Blue classification is systematically incomplete.
- Combined with the Blue category, this represents a structural weakening of India's pollution classification architecture.



## CONCLUSION:

# BLUEWASHING AN ENVIRONMENTAL AND PUBLIC HEALTH DISASTER

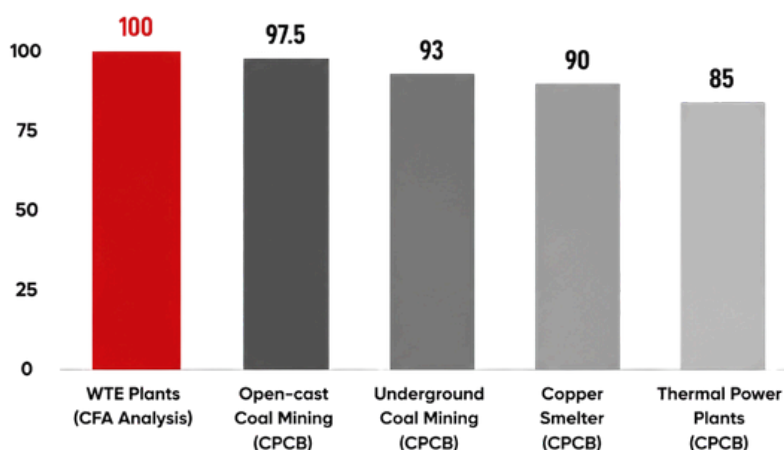
This study applied CPCB's Pollution Index methodology to four operational WTE plants in Delhi Okhla, Ghazipur, Bawana, and Tehkhand using pollution data drawn exclusively from CPCB's technical documents and regulatory submissions before the National Green Tribunal and the Supreme Court.

The analysis demonstrates with clarity that municipal waste incineration inherently generates three categories of pollution: toxic air pollutants (including dioxins, furans, and heavy metals), multiple streams of industrial wastewater (leachate, ash quenching effluent, scrubber water), and large volumes of hazardous ash requiring secured disposal. When evaluated against CPCB's own PI scoring thresholds both the 2016 framework ( $PI \geq 60$  = Red) and the 2025 revision ( $PI \geq 80$  = Red) the documented pollution characteristics of Delhi's WTE plants place them firmly within the Red category range, at approximately  $PI = 97.6-100$ .

Therefore, in response to the primary research question: *Do Waste-to-Energy incineration plants legitimately qualify for the "Blue" category under CPCB's categorisation framework?* The evidence demonstrates that such classification is inconsistent with CPCB's own documented pollution profiles, its PI scoring methodology, and the precautionary principle which CPCB itself cites as the foundation of its classification system. The Blue classification appears to be a policy choice not a scientifically justified one based on pollution data.

## WTES VS OTHER HIGH POLLUTING INDUSTRIES

CPCB's Pollution Index (Out of 100)

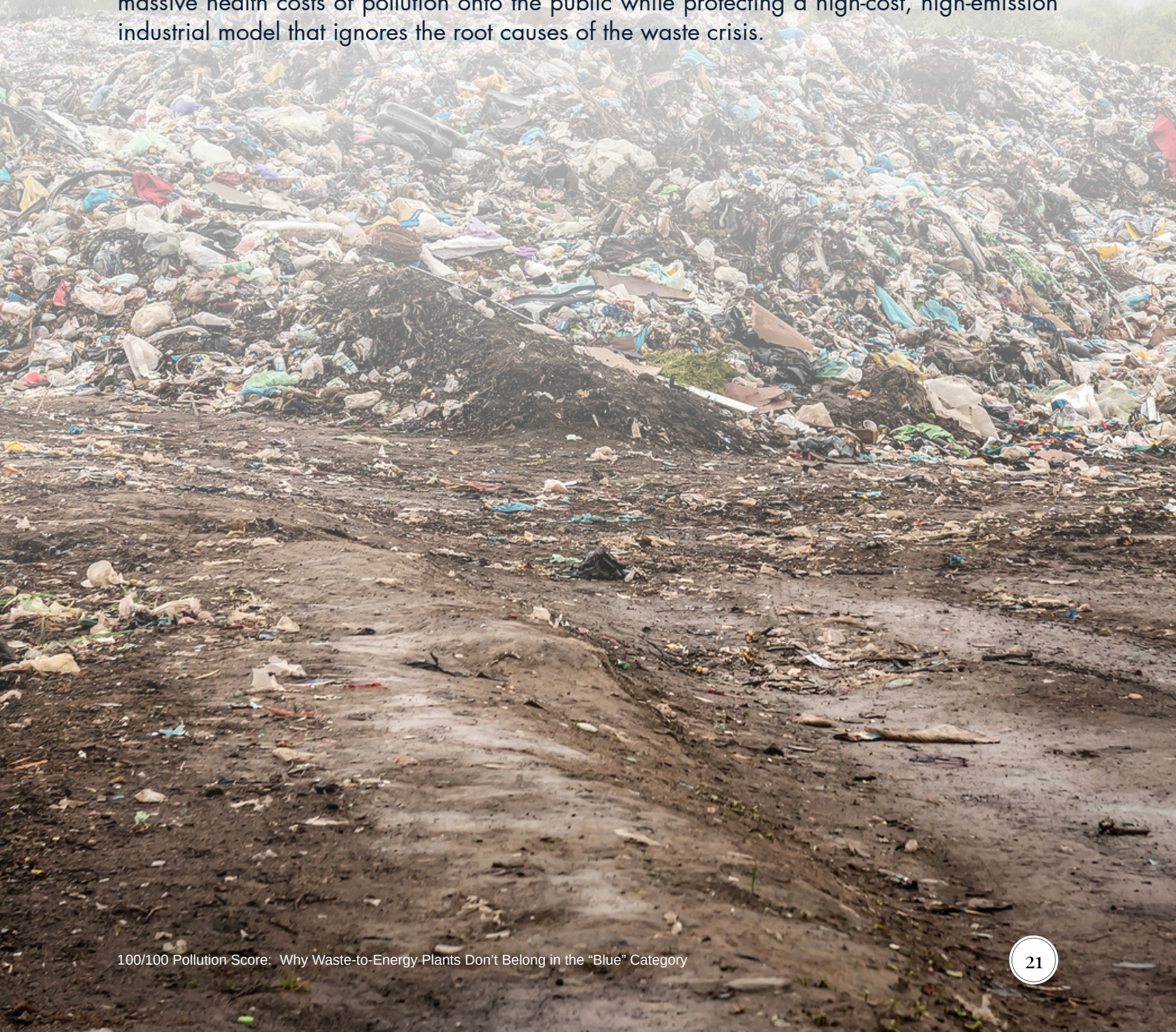


**Note:** WTE Pollution Index (100) is calculated by CFA using CPCB's published Pollution Index methodology. All other industry values are official CPCB Pollution Index scores (as per CPCB, 2025).



The "Blue" classification of WTE plants is not merely a technical error but a fundamental policy failure that prioritizes administrative convenience over human life. If the Pollution Index were applied faithfully using the CPCB's documented evidence, WTE incineration consistently returns a PI score of 100/100 —a finding that should be the non-negotiable starting point for regulation of these industries. By "bluewashing" these facilities, the state effectively sanctions the most "toxic industry" to continue its operation by dismantling existing environmental and health safeguards. This regulatory shift also carries a staggering human cost for the marginalized communities living in the shadows of these chimneys. Beyond the immediate health crisis of respiratory diseases and cancers linked to dioxins and heavy metals, there is a profound economic burden: families are pushed deeper into poverty by mounting medical bills and the loss of productivity.

Falsely advertised as a solution to waste crises, WTE incineration fails to address the waste crisis, which is rooted in overproduction and consumption. These facilities are also climate regressive, emitting 68% more greenhouse gases per unit of energy than coal plants. The diversion of public money towards WTEs effectively starves genuine, cost-effective circular economy initiatives and sustainable renewables such as biogas plants, externalizing the massive health costs of pollution onto the public while protecting a high-cost, high-emission industrial model that ignores the root causes of the waste crisis.





# 100/100 POLLUTION SCORE: WHY WASTE-TO-ENERGY PLANTS DON'T BELONG IN THE “BLUE” CATEGORY

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